23.0 REGULATORY COMPLIANCE/CODES

23.1 *Regulatory Compliance*

23.1.1 The Contractor shall comply with all applicable Federal, State and local laws, HAS Airport Policies, ordinances, rules, and regulations pertaining to the performance of the Work specified herein.

23.1.2 Licenses, Permits and Bonding: All personnel engaged in the maintenance activities must possess certificates of training, licenses, permits, and bonding as required by the Federal, State, County, HAS, and other local authorities having jurisdiction and as specified for each activity they will be directly engaged in or supervise. All certificates of training, licenses, permits and bonds shall be current and valid and available immediately upon request by HAS.

23.1.3 The Contractor shall obtain and pay for all permits, licenses, certifications and approvals required to perform services under the Agreement.

23.1.4 The Contractor shall schedule recurring inspections and certifications, and pay all associated fees.

23.1.5 The Contractor shall obtain any permits required to work on the Airports, including in restricted areas, as defined by Federal, State and local laws, City policies, procedures, ordinances, rules, codes and regulations. Both the Contractor's business and the Contractor's employees, including sub-Contractor's employees, must be certified to work on the Airports property, including restricted areas.

23.1.6 The Contractor shall be required to provide, as requested and on demand, all licenses, permits, certifications, and other such proof of qualifications for any personnel required to work on the Airports, including restricted areas, for proper execution of the Agreement.

23.2 *Testing and Reporting Required by TCEQ and Federal Agencies*

23.2.1 The Contractor shall take all steps necessary to operate and maintain boilers to ensure compliance with all current TCEQ regulations and those stipulated by Federal EPA New Source Performance Standards. Record keeping and compliance standards may be different for "new" boilers versus "grandfathered boilers," and Contractor shall implement the correct procedures for each. Contractor shall apply standard combustion control techniques such as proper excess air firing, flue gas analysis, and properly maintaining the burner/boiler packages. Within the first 90 days under the Agreement, Contractor shall study past stack tests for existing boilers to confirm that these systems are within the limits of the operating permits and the Maximum Allowable Emission Rate Tables furnished by the TCEQ.

23.2.2 As new or revised regulations are placed into effect, and HAS performs any replacement, retrofit, and/or reconstruction of the boiler packages to keep them in compliance with the new standard(s), Contractor shall modify its operation and maintenance procedures and its testing and reporting procedures to ensure compliance with regulations.

23.3 *Codes and Standards*

23.3.1 Except where specified or exceeded by the requirements of the specification, the Contractor shall conform to the latest edition of the following Codes:

23.3.1.1 Federal, state, and local building, plumbing, mechanical, electrical, safety and environmental codes.

23.3.1.2 National Electrical Code (NEC).

23.3.1.3 International Plumbing Code.

23.3.1.4 International Mechanical Code.

23.3.1.5 International Fire Code.

23.3.1.6 International Energy Conservation Code.

23.3.1.7 State and Local Building Codes and Ordinances.

23.3.1.8 State and Local Fire Codes and Regulations.

23.3.1.9 Federal Aviation Standards and Regulations.

23.3.1.10 Occupational Safety and Health Administration Regulations.

23.3.2 Codes and Standards listed above and throughout these specifications are minimum standards.

24.0 OPERATING PHILOSOPHY (IAH), (HOU) & (EFD)

24.1 General *Requirements*

24.1.1 Best-in-Practice Service of HVAC SYSTEMS, maintaining specified environmental conditions, and cost-effective energy management are of paramount importance in operating and maintenance of the Airports HVAC SYSTEMS. Contractor shall observe OEM recommended preventive maintenance and maintenance practices and procedures. Contractor shall comply with applicable Federal, State and Local regulations of Authorities having jurisdiction including regulations of Occupational Safety and Health Act (OSHA), Environmental Protection Agency (EPA) requirements and recommended practices of National Institute for Occupational Safety and Health.

24.1.2 The operating procedures, used by Contractor, must be in accordance with OEM instructions contained in applicable manufacturers' manuals for individual items of equipment, including the latest OEM technical/user manuals, service bulletins, service advisories, product/service information updates, and all other such OEM published information pertaining to the maintenance and operation of HVAC SYTEMS. Contractor's operating procedures must address overall operation of the plant, taking into account the interrelationships of various systems to ensure that proper sequences are followed in start-up, shutdown, or in making operating adjustments. All written operating instructions and procedures must be readily available to operating personnel at all times for reference.

24.1.3 It is recognized that Contractor has no responsibility regarding design of the facilities, which it will operate and maintain. However, where it is evident that safety, reliability or efficiency can be improved through capital investment in equipment, analyzers, instrumentation, etc., Contractor shall bring such matters to the attention of the Director in writing for his consideration and action as the Director deems appropriate.

24.2 *Operating Philosophy*

24.2.1 The (IAH) chilled water system is a primary-secondary variable pumping system. The primary pumps, chillers and the automatic pressure bypass are located in the (IAH) Central Plant. Secondary pumps are located in the Terminals. Terminals A, B, C, D, and FIS have secondary pumps that are variable speed drives.

24.2.2 For the (IAH) Central Plant to deliver adequate chilled water (flow and pressure), it is imperative that the design chilled water rise (15°F) be maintained during all cooling load conditions. The (IAH) Central Plant is designed for a 40°F leaving water temperature. All existing air handling equipment is adjusted for 42°F entering water temperature and leaving air temperature and air quantity at the coils to provide for a 15°F chilled water rise. All new equipment is being designed for 42°F entering water temperature and a 15°F chilled water rise. Any cooling equipment and controls not maintaining design must be promptly identified, cleaned and/or repaired then, if not balance, the Director shall be notified.

24.2.3 (HOU) Operating Philosophy

24.2.3.1 The (HOU) existing chilled water system is a primary variable pumping system. The primary pumps and chillers are located in the Central Plant. Booster pumps exist at some AHUs. The new (HOU) chilled water system is a primary-secondary system with all pumps in the central plant. Secondary pumps are scheduled for variable speed drives.

24.2.4 (EFD) Operating Philosophy

24.2.4.1 Contractor shall operate and maintain HVAC equipment at (EFD) to provide optimum performance, energy usage, and reliability.

24.2.4.2 Contractor shall rotate the chilled water pumps and compressor usage on the units located at 510 Administration building.

25.0 OPERATE THE HVAC SYSTEMS (IAH) & (HOU)

25.1 As a part of Basic Services throughout the Term of the Agreement, Contractor shall operate all heating, ventilation, exhaust, re-circulating and air conditioning and related systems for (IAH) in the Central Plant, Terminals A, B, C and D, Aviation Administration Building, ASC facility, Remote Buildings/Facilities, Miscellaneous DX Equipment and all new facilities that may be built and start operation within the Term of the Agreement.

25.2 Contractor shall operate all heating, ventilation, exhaust, re-circulating and air conditioning and related systems for (HOU) in the Central Plant, Terminal, Building at 8800 Paul B. Koonce Blvd., Building, Remote Buildings/Facilities, Miscellaneous DX Equipment and all new facilities that may be built and start operation within the Term of the Agreement.

25.3 Contractor shall operate and maintain HVAC systems and equipment that include, but are not limited to, the following:

25.3.1 All Central Plant mechanical and electrical systems, for (IAH) and (HOU), including chilled water generation system, condenser water system, steam generation system, high temperature and domestic hot water generation systems, pumping, controls, instrumentation, plumbing system, electrical system, heating system, pneumatic systems, ventilating, exhaust and re-circulating systems.

25.3.1.1 Within the Central Plants, the Contractor shall maintain all plumbing systems back to the main line. The Contractor's responsibilities for the plumbing systems within peripheral areas are those HVAC related items such as drains in the mechanical rooms (air handlers, condenser drains, sewage/sump pump and pits, heat exchanger plumbing from tanks to pumps to walls, etc.).

25.3.1.2 Within the Central Plants, Contractor shall clean, inspect, maintain and repair the electrical distribution components as necessary from the point where the power comes into the transformer complex at the plant (refer also to the Annual Maintenance Shutdown Procedures, Exhibit J). In peripheral areas, Contractor shall maintain the HVAC electrical systems from the existing panels.

25.3.1.3 Contractor shall maintain the SW to MCC and MCC to Equipment at (IAH) and (HOU).

25.4 All outdoor systems and equipment related to the Central Plant including piping, pumps, cooling towers, utility services, transformers, cables and switchgear.

25.5 All heating, ventilating, exhaust, re-circulating and air conditioning systems and related systems/equipment for (IAH) in Terminals A, B, C, D, FIS, Aviation Administration Building, ASC facility, Remote Buildings/ Facilities and Miscellaneous DX Equipment, including, but not limited to, heating, ventilating and air conditioning units, exhaust and re-circulating fans, automatic temperature controls, instrumentation, pumps, piping system, ductwork, mixing boxes, panel boards, motor starters, disconnect switches and wiring, VAV boxes and electronic air cleaners, etc.

25.6 All heating, ventilating, exhaust, re-circulating and air conditioning systems and related systems/equipment for the Airports in Terminal Concourse Areas, Old FAA Tower, FAA Motor Maintenance Building, Remote Buildings/Facilities and Miscellaneous DX Equipment, including, but not limited to, heating, ventilating and air conditioning units, exhaust and re-circulating fans, automatic temperature controls, instrumentation, pumps, piping system, ductwork – including all supply and return air components, mixing boxes, and panel boards, motor starters, disconnect switches and wiring, VAV boxes and electronic air cleaners, etc.

25.7 Clean and repair all HVAC vents, registers and intake grilles. Exception will be terminal A main lobby vents, until HAS completes a project upgrade.

25.8 Domestic hot water generating systems for the Terminals, and all related controls, plumbing and electrical equipment and systems within their respective equipment rooms. HAS personnel will maintain all domestic hot water and re-circulating hot water piping outside the mechanical room.

25.9 (IAH) - Maintain and monitor existing high/low temperature sensor alarms located in the telecommunication equipment/switch rooms located in Terminals A and Aviation Administration Building. Both are monitored from the Central Plant via Aviation provided cabling. Contractor is not responsible for the cabling of the sensors to the Central Plant. In the event of a problem associated with the cable, Facilities Administration and AMIS are to be contacted.

25.10 Evaluate and troubleshoot electronic and electrical control systems to ensure appropriate repairs are made and maintained.

25.11 Replace lamps, ballast, sockets, photocells, etc., in the Central Plants (interior and exterior) and all mechanical rooms with air handling units or sump pits in the terminal(s) and remote buildings.

25.12 (IAH) - Operate and maintain the Terminal D -Alerton system.

25.12.1 (IAH), (HOU) & (EFD) Operating Procedures and Manuals – Contractor is responsible for obtaining/providing the following manuals for use in the operation and maintenance of HVAC SYSTEMS.

25.12.1.1 Operations Manual.

25.12.1.2 Equipment Manuals and Equipment Data Sheets.

25.12.1.3 Systems Manual.

25.12.2 When available HAS will provide manuals etc. to Contractor.

25.12.3 Operations Manual, Equipment Manuals, and Equipment Data Sheets address the HVAC equipment from a component perspective. The Systems Manual details the operational procedures of the HVAC equipment from a procedural perspective. Contractor shall use these manuals in the operation and maintenance of the facilities.

25.12.4 Contractor shall follow the procedures in the Operations Manuals and ensure the Operations manuals and data sheets, technical/user manuals, service bulletins; service advisories, product/service information updates, and all such other OEM published information pertaining to the maintenance and operation of HVAC systems and equipment are updated and maintained.

25.12.5 Some equipment installed by tenants and the City may not be included in the equipment manuals. Contractor shall obtain any missing pertinent data for the equipment manuals for any equipment installed by:

25.12.5.1 Tenants which has become the property of the City or,

25.12.5.2 By Director, all being part of Contractor's responsibility.

25.12.6 HAS will assist in the transfer of available copies of the operations manuals and the equipment manuals to Contractor upon HAS issuance of notice to proceed document for each Airport.

25.12.7 Updating of the Equipment Manual shall be completed by the end of the first year of the Agreement and shall include development by Contractor of Equipment Data forms expanded to include all data pertinent to the normal operation and maintenance of each piece of mechanical and related electrical equipment. Such data shall include in addition to existing data, the sheave and belt sizes, motor data, starter and heater sizes, and the manufacturer's data identifying the equipment or component. Recommended changes in the Operations Manual, as a result of knowledge and experience with the systems, shall be submitted in writing for the Director's consideration. These suggestions will be taken under advisement by the Director. As required, the suggestions will be reviewed by the Director with Contractor. Resulting changes to the Operations Manual shall be the responsibility of Contractor. Once finalized and completed by the end of the first year of the Contract, Contractor shall maintain and update the documents.

26.0 PERFORMANCE STANDARDS (IAH), (HOU) & (EFD)

26.1 *General*

26.1.1 Contractor's operation and maintenance of Airports HVAC systems and equipment must be in accordance with the highest standards prevailing in the industry, recommendations of the OEM, as well as all applicable codes, rules, regulations, and laws of any regulatory or legislative body having jurisdiction over IAH, HOU, and EFD which include, but are not limited to, State of Texas agencies having jurisdiction over boiler operations, Texas Commission on Environmental Quality (TCEQ) over certain environmental matters, and Federal regulatory bodies, including, but not limited to EPA, OSHA, TSA, and FAA. Contractor shall ensure full compliance and shall bear the cost of any additional work or materials not specified that may be required. Any violation, omission, or question of compliance must be brought to the attention of the Director.

26.1.2 Contractor shall respond immediately to a request from the Director for emergency service to perform all steps reasonably necessary to protect persons and property from risk of harm due to a problem with the system. Priority must be given to requests for emergency service.

27.0 ENVIRONMENTAL CONDITIONS (IAH), (HOU) & (EFD)

27.1 As a part of Basic Services, Contractor shall maintain the following environmental conditions within occupied conditioned spaces, unless otherwise specified in the Agreement or requested by the Director.

(IAH), (HOU), (EFD)	Summer	Winter
Cooling Temperature	74°F ± 2°F	74°F ± 2°F
Design Day	97°Fdb and 80°Fwb	22°Fdb
Humidity	55% + 5%	40% max.
Heating Temperature	74°F ± 2°F	74°F ± 2°F

27.2 *(IAH) – Central Plant Reserve Capacities*

As part of Basic Services, Contractor shall operate the (IAH) Central Plant facilities in such a manner as to provide all heating and cooling systems at 100% capability. Exception to this will be equipment off-line for needed repairs and/or annual preventative maintenance service.

27.3 *(HOU) – Central Plant Reserve Capacities*

As part of Basic Services, Contractor shall operate the (HOU) Central Plant facilities in such a manner as to provide all heating and cooling systems at 100% capability. Exception to this will be equipment off-line for needed repairs and/or annual preventative maintenance service.

28.0 HVAC SYSTEMS AND RELATED EQUIPMENT (IAH), (HOU), & (EFD)

28.1 The Airports HVAC Systems and Related Equipment in the Central Plants covered under Basic Services include, but are not limited to,:

28.1.1 All mechanical and specified plumbing systems and all related electrical systems to include heat exchanger tubing bundles.

28.1.2 Pneumatic and electronic systems associated with the generation of chilled water, steam, high temperature water, and heating water.

28.1.3 Cooling and heating water distribution and pumping systems within the Central Plant and Terminals.

28.1.4 Controls.

28.1.5 Instrumentation.

28.1.6 Central Plant lighting, inside and outside Building Lights and Cooling Tower Lighting.

28.1.7 Central Plant domestic cold and hot water.

28.1.8 Storm and sanitary sewer systems to the main line, including main room floor drains.

28.1.9 Odor masking/odor control.

28.1.10 Water treatment services and water treatment chemicals.

28.1.11 Full housekeeping services in the Central Plants and Contractor's office areas.

28.2 The Airports Electrical Systems in the Central Plants covered under Basic Services include, but are not limited to,:

28.2.1 All related pneumatic and electronic systems associated with the generation of chilled water, steam, high temperature water, heating water, cooling and heating water distribution and pumping systems

28.2.2 Controls.

28.2.3 Instrumentation.

28.3 The Airports HVAC Systems and Related Equipment from the Airports Central Plants to the most remote points in the Terminals, Concourses and/or Flight Stations covered under Basic Services include but are not limited to:

28.3.1 All associated HVAC systems, equipment and components including, but not limited to, all cooling and heating water - pumping systems including.

28.3.2 All pneumatic compressors and related controls.

28.3.3 All air side mechanical rooms.

28.3.4 All domestic hot water generation and storage water systems to include all Backflow preventers in all mechanical rooms.

28.3.5 All related controls and electrical service.

28.3.6 All air handler units and air distribution systems and components including ductwork, mixing boxes and controls actuators and VSD's.

28.3.7 All exhaust and re-circulating fans and controls.

28.3.8 All automatic temperature controls and instrumentation.

28.4 The Airports Electrical Systems and Related Equipment from the Airports Central Plants to the most remote points in the Terminals, Concourses and/or Flight Stations covered under Basic Services include, but are not limited to,:

28.4.1 All electrical service systems, equipment and components serving HVAC systems, equipment and components. (All encompassing with exception of high voltage transmission lines and sub-stations).

28.4.2 All electrical service to and electrical service of motor control centers.

28.4.3 Mechanical panel-boards, fused switches and circuit breakers, motor starters, disconnect switches, conduit, wiring, and related electrical controls.

28.4.4 All specified stand-alone A/C units, heaters, furnaces; and other related equipment.

29.0 (IAH) SYSTEM OVERVIEW - PERFORMANCE REQUIREMENT SYNOPSIS

29.1 (IAH) Central Plant

29.1.1 The IAH Central Plant houses all of the major equipment providing a closed loop chilled/hot water HVAC system to Terminals A, B, C, D and FIS Building. As a part of Basic Services, Contractor shall operate

and maintain all systems within the Central Plant. The major systems include, but are not limited to, the following:

29.1.2 Steam Generating System.

29.1.3 Hot Water System.

29.1.4 Refrigeration Units.

29.1.5 Chilled Water System.

29.1.6 Condenser Water System.

29.1.7 Service Water System.

29.1.8 Compressed Air System.

29.1.9 Air Distribution, Heating, Ventilating and Exhaust Systems.

29.1.10 Auxiliary Systems.

29.1.11 Electrical Equipment.

29.1.11.1 High Voltage Transformers for Chillers and Motor Control Centers (transformers located adjacent to the Central Plant building) and across the street in the electrical sub-station.

29.1.12 The primary heating and cooling mediums are conveyed from the Central Plant via tunnel to Terminal B and underground chilled water connecting west of Terminal C where distribution is accomplished to the rest of the complex.

29.1.13 The Central Plant also houses the Administration Offices for Contractor and the repair facilities for the Contractor's 24-hour on-site staff complete with break and restroom/shower facilities.

29.2 *(IAH) Central Plant Equipment*

29.2.1 Contractor shall operate and maintain all systems in or associated with the Central Plant. A detailed listing of Central Plant Equipment is provided in The HVAC Equipment Inventory List Exhibit I.

29.2.2 Contractor shall operate and maintain all electrical power distribution from the point the power comes into the transformer complex at the plant.

29.2.3 Contractor shall operate and maintain all HVAC-related piping systems, electrical distribution systems and appurtenances from the Central Plant to the Terminals and Old FAA Tower.

29.2.4 Contractor shall maintain all domestic water components from the meter that supports the Central Plant functions (i.e. cooling towers, makeup water, standpipes, fill pipes, backflow preventers, and domestic water within the plant).

29.2.5 Contractor shall maintain all the chilled and hot water piping to all demarcation points (i.e. Old FAA Tower entrance valve point and all other (IAH) distribution side chilled and hot water).

29.2.6 HAS will provide access (digging, trenching, etc.) to piping outside the building envelope, which is not accessible through the tunnel system or other accessible means in order for Contractor to perform repairs.

29.3 *Performance Requirements at (IAH) - Terminals A, B, C, D, and FIS*

29.3.1 General

29.3.1.1 (IAH) Terminal Buildings A, B, C, D, and FIS are supplied primary heating and cooling mediums from the remote Central Plant facilities located at the west end of Will Clayton Parkway. The Terminal systems are designed to maintain 74°F ± 2°F indoor temperature through wide variations of outdoor temperature utilizing chilled and high temperature hot water. The mediums are conveyed in tunnels and pedestrian walkways to each terminal. The Central Plant system is capable of supplying chilled water

at 40°F on demand to meet peak cooling demands with no more than 42°F at the coil. The Plant is also capable of supplying high temperature hot water at a temperature of 300°F on demand to meet peak heating requirements. Hot water for domestic use and kitchen use is converted by shell and tube heat exchangers in hot water generators at each Terminal Complex. The Domestic hot water systems are designed to provide 160°F water. HAS will select Primary and Domestic Hot Water Temperature settings as required to meet requirements in individual Terminals. Contractor shall maintain all primary water, air, and secondary air systems to meet design and performance requirements set forth in the specific Contract documents under which they were installed. A detailed listing of Terminals Equipment is provided in HVAC Equipment Inventory List Exhibit I, Coil leaving air temperatures are generally designed for 52.5°F leaving air temperature for all new equipment and new coils with 42°F entering water while maintaining a 15°F water temperature rise. Lowering leaving air temperatures below 52.5°F is not acceptable as a satisfactory solution to resolving any space temperature control problem. This Practice results in lower water temperature rise reducing Central Plant and Distribution System Deliverable Capacities. AHU system balancing including Fan and Coil, maintaining clean filters, and cleaning coils are the proper ways to maintain AHU System performance in accordance with design conditions. 2-inch, Merv 8 pleated filters need to be changed out at .8 inches on the magnehelic, 6-inch box filters need to be changed out at 1.25 inches. NO EXCEPTIONS. Any time the Director finds dirty filters on any AHU that unit will have the coils cleaned. Coil cleaning will be done on third shift, NO EXCEPTIONS.

29.3.2 (IAH) Terminal Buildings A, B, C, FIS, and APM.

29.3.2.1 Air Handling Equipment or air handling units with new coils in these Terminals have been designed and selected for 52.5°F leaving air temperature. Equipment installed prior to 1990 is all designed to meet a performance requirement of 54°F with 42°F chilled water at the coil. Under these conditions all unit coils will produce a 15°F Water Temperature Rise. Air temperature leaving coils must not be set below a temperature resulting in less than a 15°F water temperature rise.

29.3.3 Below Grade – Inter-Terminal Train (ITT) Level.

29.3.3.1 The ITT Level of both Terminals consists of Mechanical and Electrical rooms to the south of the ITT Track area. The Electrical Rooms serve primary electric power to the Terminals. "Pump Rooms" in each Terminal contain pumps to provide adequate pressure and flow for cooling and heating water to the Terminals. High temperature water heat exchangers for generation of heating water are also located in the pump rooms. Domestic hot water generators/storage tanks in this same area provide domestic hot water for the Terminals.

29.3.3.1.1 Terminal A has developed areas north of the tracks at the ITT Level but Terminal B has not. This area in Terminal A contains the ITT Train service and maintenance area and other general airport service equipment and other service agencies. These areas are cooled and heated by multi-zone and single-zone units. All outside air is pretreated.

29.3.3.1.2 Below the elevator core area of the ITT Level in both Terminals A & B are elevator machine rooms. These rooms contain an air-handling unit to cool elevator machinery.

29.3.3.2 Train-Pedestrian Tunnel

29.3.3.2.1 This area is served by low pressure single zone units located in fan rooms adjacent to Pump Rooms in Terminals A & B and in rooms at or under Stairwells #2, #4, #5, #7 and #9 and at the ITT Train Turn-around at Terminal D Train Stop. Low-pressure single zone variable temperature units without outside air pretreatment units serve the pedestrian Tunnel. The supply is routed above the ceiling to conventional diffusers with air returned through the ceiling plenum, then to a main return duct to the AHU mechanical room. The Pedestrian Tunnel will be maintained at 74°F.

29.3.4 Ground Level, Second Level and Mezzanine Level

29.3.4.1 The ground levels of both Terminals A & B are used as general terminal access, baggage handling and claim and private offices for Airport personnel and airline baggage services. The second floor is ticketing, food service and airline ticketing office areas. This level also provides access to arrival and departure areas in the concourses of Terminal A.

29.3.4.2 On the 1st parking level of Terminals A & B, four major quadrant air handling mechanical rooms serve the terminal building ground, second and mezzanine level areas. The mechanical rooms are positioned over the wings of the terminals and contain two recently upgraded AHU's, one double duct type and one multi-zone type, and one new outside air pretreatment unit (OAPU) to serve the primary terminal areas. The space temperature through the air distribution system is controlled with dual duct fan powered air terminal units. The new OAPUs provide outside air to the two AHUs serving general public and private office areas. Supply air is conveyed downward to the mezzanine, second and ground levels through supply/return air chases in the various quadrant wings of the Terminal below the mechanical equipment rooms. Cold supply air must be maintained at 52.5°F for humidity and temperature control on all these units.

29.3.4.3 The ground level baggage pick-up areas are served by the multi-zone systems and office areas by dual duct systems. Each office zone is controlled by local thermostats controlling a dual duct mixing box. Multi-zone systems are controlled by thermostats and the AHU mixing damper section at the unit.

29.3.4.4 The dual duct control settings for the new and existing upgraded units with new cooling coil systems are scheduled for 52.5°F cold deck settings. Hot deck settings will vary with the zone of greatest heating demand to maintain a 74°F ± 2°F indoor temperature.

29.3.4.5 Pedestrian traffic, baggage and high infiltration rates create greater filter maintenance on the ground and second level AHU's. Filters on AHUs at these levels will be scheduled for more frequent replacement.

29.3.5 Ground Level, Ticket Level & Mezzanine Level – Terminals A & B

29.3.5.1 Flight Stations in Terminal B - These flight stations are part of the Terminal B complex.

29.3.5.2 Flight Stations 5, 7 and 8 have dual duct fan powered air terminal units installed in 1990. Flight Station 6 has dual duct air terminal units installed in 1996 that are not fan powered. Coil leaving air temperatures should be set on these units at a minimum of 54°F to assure adequate return water temperature.

29.3.5.3 Terminal B Concourse Ways to Flight Stations - The four concourse ways were designed into the original complex to provide access to flight stations. These concourse ways are served by low-pressure single-zone units with outside air pretreatment units. The supply is routed above the ceiling to conventional diffusers with air returned through the ceiling plenum, then to a main return duct to the AHU mechanical room. Coil leaving air temperatures should be set on these units at a minimum of 52°F to assure adequate return water temperature. The outside air pretreatment unit serving air to concourse way units should have the cold deck temperatures at 52.5°F.

29.3.5.4 Grade Level of Flight Stations - The grade level is conditioned by a dual duct system with one AHU. Dual-duct and single duct fan powered ATUs (mixing boxes) and variable air volume ATUs are controlled by zone thermostats.

29.3.5.5 Coil leaving air temperatures should be set on these units at a minimum of 54°F to assure adequate return water temperature.

29.3.5.6 Second Level of Flight Stations - This space serves as the passenger arrivals/departure area. This level is conditioned by two dual duct systems with two AHUs, one serving the east and the other serving the west half of the flight station. The controls are similar to the terminal building systems. Space temperature is controlled through Dual-duct and single duct fan powered ATUs (mixing boxes) by zone thermostats. Coil leaving air temperatures should be set on these units at a minimum of 54°F to assure adequate return water temperature.

29.3.6 Terminal Building D

29.3.6.1 Terminal D is situated directly east of Terminal C and north of the West bound terminal through road. It is essentially a four-story linearly configured structure with a two-story connecting corridor to the West, which connects Terminal D with Terminal "C." The remote Central Plant supplies primary heating and cooling mediums for the Terminal. The mediums are conveyed through primary piping systems in tunnels and pedestrian walkways connecting all terminals with the Central Plant.

29.3.6.2 Terminal D HVAC Equipment

As a part of Basic Services, Contractor shall operate and maintain all HVAC systems in or associated with Terminal D. A detailed listing of Terminal D Equipment is provided in HVAC Equipment Inventory List Exhibit I. The following is a general description of Terminal D HVAC equipment.

29.3.6.2.1 Air Handling Units and associated Control Valves.

29.3.6.2.2 Outside Air Pretreatment Units.

29.3.6.2.3 Electronic Air Cleaners and Carbon Filter Systems.

29.3.6.2.4 Fan Powered Air Terminal Units w/ Heating Coils.

29.3.6.2.5 Exhaust/Circulating Fans (Baggage Make-Up).

29.3.6.2.6 Fan Coil Units.

29.3.6.2.7 Heating and Ventilating Units.

29.3.6.2.8 Heating Hot Water Converter/Generators.

29.3.6.2.9 Domestic Hot Water Converter/Generators with recirculation Water Pumps

29.3.6.2.10 Chilled Water Circulating Pumps.

29.3.6.2.11 Heating Water Circulating Pumps.

29.3.6.2.12 Domestic Hot Water Return Pumps.

29.3.6.2.13 Exhaust Fans for Inside Terminal Areas.

29.3.6.2.14 Alerton Building Management System.

29.3.6.3 In summary, there are 31 AHUs including outside air pretreatment units; Single zone, Multi-zone and Variable Volume units. There are 7 Fan coil units, 2 Heating ventilation units, 13 exhaust fans, 3 transfer fans, 1 DX split system, 16 relief fans, 7 electronic air cleaners, 4 Leibert units maintaining the requirements of the telephone and airlines file server system.

29.3.7 *Performance Requirements – Terminal D*

29.3.7.1 *Water Side System*

29.3.7.1.1 The chilled water and high temperature water systems deliver water from the Central Plant through primary water piping distribution systems in tunnels and pedestrian walkways. Chilled water is designed for delivery at 40°F supply. High temperature water is designed to deliver heating water to the Terminal at 180°F.

29.3.7.1.2 In Terminal D are two (2) variable speed control chilled water pumps. The control points for the network are a 44-66 PSI delta to be maintained in the branch circuits pressures at the ends of the network.

29.3.7.1.3 The hot water system has two (2) variable speed controls pumps. The super heated water is delivered through the tunnel and walkway. The system has two heat exchangers with a temperature reset schedule from supply water equal to 180°F at outside temperature of 20°F to 80°F.

29.3.7.1.4 The control valves on the water-side at the air handler units in Terminal D, which throttle the water through the air handlers, should be exercised quarterly.

29.3.7.2 *Air Side System*

29.3.7.2.1 Level 121 lobby - is served by several AHU's. Supply is through fan powered VAV boxes of various types, some of which have reheat capabilities. Fan powered VAV boxes without heat take care of the air conditioning requirements throughout the remaining areas with some of the small exclusive areas being handled by VAV boxes.

29.3.7.2.2 Fixed Bridges - are all conditioned with single zone air handling units with 75°F within the space, controlling the heating and cooling valves. These units are all of the Constant Volume Type.

29.3.7.2.3 Level 106 - has the full variety of units used on this "site" from Fan Powered VAV boxes with and without heat to straight forward VAV boxes without fan assist. Temperature set point as with other levels is 74°F.

29.3.7.2.4 Level 100 - which interfaces directly with the outside, uses relief fans, outside air fans, heating ventilation units and air handling units along with fan coil units. At the eastern edge of Level 100, where the airline operations have their offices and work areas, there are the full assortment of VAV box types used on site, all with 74°F as their objective.

29.3.7.2.5 Level 88 - houses the majority of offices along the interior and per design should require no heating through straight VAV units serving these areas. The lobby is basically handled by two (2) AHU's each having multiple temperature sensors with the highest and the lowest of their respective AHU controlling its hot and cold deck accordingly. The western half of the level because of its diversity of loads has all types of VAV units.

29.3.7.2.6 Level 74 and Train Tunnel areas - are serviced by VAV AHU's with 53°F set points.

29.3.7.2.7 Restricted Access Areas – Terminal D

Access to Terminal D Operations Areas is limited to Contractor's personnel, HAS employees, and certain individuals authorized by the Director, provided those persons identified by the Director do not interfere with or jeopardize the Contractor's responsibilities under the Agreement. Contractor shall conform to such identification and security procedures as the Director may deem necessary and as required by law and FAA regulations. Access must be strictly controlled and Contractor shall keep a record of all keys distributed to its personnel. Officers, employees or agents of Contractor shall never enter restricted or operational areas of Terminal D without the express permission of the Director or any other governmental bodies having jurisdiction, and Contractor hereby assumes full liability arising from any such unauthorized incursions.

29.4 *Other Remote Facilities*

29.4.1 Old FAA Tower

29.4.1.1 IAH primary distribution systems (PCHW & HTW) to the Old FAA Tower; Service Applies up to, but not including, Secondary CHW Pump Headers; Service Applies up to, but not including, Heating Water Heat Exchanger.

29.4.2 Airport Services Complex (ASC)

29.4.2.1 The Airport Services Complex (ASC) is located at 4500 Will Clayton Parkway and was put into service in March, 1992. The ASC comprises the following buildings and facilities.

29.4.2.2 Supply Chain Management/Fleet Division Offices and Supply Warehouse.

29.4.2.3 Physical Plant Maintenance (PPM) Offices and Service Bays.

29.4.2.4 Airfield & Grounds Maintenance Building.

29.4.2.5 Airfield & Grounds Maintenance/Covered Equipment Storage Sheds.

29.4.2.6 Vehicle Wash Facility.

29.4.2.7 Vehicle Fueling Station.

29.4.3 ASC HVAC Equipment

29.4.3.1 Contractor shall maintain all HVAC systems in or associated with the ASC. A detailed listing of ASC Equipment is provided in HVAC Equipment Inventory List Exhibit I. The following is a general description of the ASC HVAC equipment.

29.4.3.1.1 Packaged Chiller.

29.4.3.1.2 Air Cooled Condensing Unit.

29.4.3.1.3 Air Handling Units.

29.4.3.1.4 Air Handling Unit Filters.

29.4.3.1.5 Air Handling Unit Interlocks.

29.4.3.1.6 Ventilating Fans with thermostats, speed controls, etc.

29.4.3.1.7 Fire Dampers.

29.4.3.1.8 Electric Duct Heaters.

29.4.3.1.9 Gas-Fired Warm-Air Heating Units.

29.4.3.1.10 Air Distribution Devices.

29.4.3.1.11 Volume Dampers.

29.4.3.1.12 Liebert unit in Main Distribution Frame (MDF) Telephone Room.

29.4.3.2 Performance Requirements – ASC

Contractor shall operate the HVAC systems to maintain a year-around interior ambient of 74 degrees temperature and a maximum of 50% + 5% relative humidity in summer within the building envelope, except for the MDF Telephone room in which Contractor shall operate the Liebert unit to maintain a year-around ambient of 68 degrees with a non-condensing relative humidity.

29.4.4 *Aviation Administration Building*

29.4.4.1 Contractor shall maintain all HVAC systems in or associated with the Aviation Administration Building. A detailed listing of Administration Complex HVAC Equipment is provided in The HVAC Equipment Inventory List Exhibit I. The following is a general description of the Administration Building HVAC equipment.

29.4.4.1.1 Air Cooled Chillers.

29.4.4.1.2 Air Cooled Condensers.

29.4.4.1.3 Air Handler Units.

29.4.4.1.4 Chill Water Pumps.

29.4.4.1.5 Air Compressor with Air Dryer for instrument air.

29.4.4.1.6 Boilers.

29.4.4.2 *Performance Requirements - Administration Complex*

The HVAC system should maintain a year-around interior ambient of 74 ± 2 degrees temperature and a maximum of 50% + 5% relative humidity in summer within the building envelope.

29.4.5 Supply Chain Management/Fleet Building

29.4.5.1 Contractor shall maintain all HVAC systems in or associated with the Supply Chain Management/Fleet buildings. A detailed listing of Supply Chain Management/Fleet Buildings HVAC Equipment is provided in The HVAC Equipment Inventory List Exhibit I. The following is a general description of the Supply Chain Management/Fleet Buildings HVAC equipment.

29.4.5.1.1 Chillers (1) 80 Ton & (1) 50 Ton.

29.4.5.1.2 CHW pumps.

29.4.5.1.3 Chill Water Pumps.

29.4.5.1.4 Air Handler Units.

29.4.5.1.5 Controls.

29.4.5.1.6 Duct & Grills.

29.4.5.2 *Performance Requirements – Supply Chain Management/Fleet Buildings*

The HVAC system should maintain a year-around interior ambient of 74 ± 2 degrees temperature and a maximum of 50% + 5% relative humidity in summer within the building envelope.

29.4.6 Other Remote Buildings/Facilities

29.4.6.1 In several remote buildings and structures at the Airport, Contractor shall maintain the HVAC equipment. It is anticipated that certain of these facilities, which are HAS-owned, will be leased to other tenants during the Agreement Term, and future lease agreements may transfer responsibility for maintaining applicable HVAC equipment to the new leaseholder; it is anticipated that certain facilities, which are non-HAS-owned, but currently leased by HAS, will be excluded from the Agreement at the termination of lease periods; it is anticipated that quantities of Security Guard/Taxi Booths may increase or decrease during the Agreement Term. Remote buildings and structures include the following:

29.4.6.1.1 *18845 Col. Fischer Dr. (Fleet Maintenance Facility).

29.4.6.1.2 Vault #1432.

29.4.6.1.3 FAA Motor Maintenance.

29.4.6.1.4 Vault 927.

29.4.6.1.5 *U.S. Customs Cargo Bldg. (Cargo Buildings "A" and "B").

29.4.6.1.6 *Cargo Area (USDA APHIS 3014 McKaughan).

29.4.6.1.7 Vault 826.

29.4.6.1.8 *5051 Wright Road.

29.4.6.1.9 3060 Air Freight (Freight Forwarder Building).

29.4.6.1.10 Security and Taxi Booths.

29.4.6.1.11 Cargo Building N Suites A & B1, 18500 Lee Road (Airport Engineers).

29.4.6.1.12 Fire Stations.

29.4.6.1.13 Equestrian Center on Luthe Rd.

**(Locations marked with asterisk and italicized indicate facilities most likely to be affected by future lease agreements).*

29.4.7 Remote HVAC Equipment

29.4.7.1 Contractor shall maintain all HVAC systems in or associated with the remote buildings and structures. A detailed listing of Remote Equipment is provided in The HVAC Equipment Inventory List Exhibit I. A general description of the remote HVAC equipment follows:

29.4.7.1.1 Air Cooled Condenser Units.

29.4.7.1.2 Air Handler Units.

29.4.7.1.3 Fan Coil Units.

29.4.7.1.4 Gas Flow Furnaces.

29.4.7.1.5 Forced Air Furnaces.

29.4.7.1.6 Boiler.

29.4.7.1.7 Air Compressor w/ air dryer.

29.4.7.2 Performance Requirements – Remote

The HVAC system should maintain a year-around interior ambient of 74 ± 2 degrees temperature and 50% relative humidity within the building envelop.

29.4.8 *Miscellaneous DX Equipment*

29.4.8.1 The IAH airport system includes certain buildings housing both HAS employees and airport tenants that fall outside the chilled water closed loop system including Airport Services Complex, HAS Administration Building, Supply Chain Management/Fleet buildings, and Other Remote Buildings/ Facilities. The designation (DX) in these documents identifies those specific stand alone systems for which O&M HVAC services Contractor is responsible to operate and maintain. The systems in these facilities range from stand alone 3/4-ton window units to complete packaged heating and cooling units.

29.4.9 *Miscellaneous (DX) HVAC Equipment*

29.4.9.1 Contractor shall maintain certain DX HVAC equipment. A detailed listing of Miscellaneous (DX) HVAC Equipment is provided in The HVAC Equipment Inventory List Exhibit I.

29.4.9.1.1 Window Units.

29.4.9.1.2 Packaged Units.

29.4.9.1.3 Roof Unit.

29.4.9.1.4 Blower Unit.

29.4.9.2 Performance Requirements Miscellaneous (DX).

The HVAC system should maintain a year-around interior ambient of 74 °F ± 2° F temperatures and 50% relative humidity within the building envelope.

30.0 (HOU) AIRPORT SYSTEM OVERVIEW - PERFORMANCE REQUIREMENT SYNOPSIS

30.1.1 *(HOU) Central Plant*

30.1.2 The Central Plant houses all of the major equipment providing closed loop chilled/hot water HVAC system to the Terminal. Contractor shall operate and maintain all systems within the Central Plant. The major systems are as follows:

30.1.2.1 Hot Water System.

30.1.2.2 Refrigeration Units.

30.1.2.3 Chilled Water System.

30.1.2.4 Condenser Water System.

30.1.2.5 Service Water System.

30.1.2.6 Compressed Air System.

30.1.2.7 Air Distribution, Cooling and Heating Air Systems.

30.1.2.8 Make-up Air, Ventilating and Exhaust Systems.

30.1.2.9 Control Systems.

30.1.2.10 Auxiliary Systems.

30.2 *Existing (HOU) Central Plant Equipment*

30.2.1 The Central Plant houses the Administration Offices for Contractor and the repair facilities for the Contractor's on-site staff. Contractor shall operate and maintain all systems in or associated with the Central Plant. A detailed listing of Central Plant Equipment is provided in The HVAC Equipment Inventory List Exhibit I. The following is a general description of the existing Central Plant HVAC equipment.

30.2.1.1 Hot Water Boilers

30.2.1.1.1 Two- (2) gas fired water tube boilers - capacity of 960 gal.

30.2.1.1.2 Two (2) HVAC hot water circulating pumps - 30 HP.

30.2.1.2 Domestic Water System

30.2.1.2.1 Water heater – 260,000 BTU.

30.2.1.2.2 Domestic hot water circulation pump – ½ HP.

30.2.1.3 Refrigeration Units – Centrifugal Water Chillers

30.2.1.3.1 Four York Chillers.

30.2.1.3.2 Four chilled water pumps, 1200 gpm @ 80Ft. head.

30.2.1.4 Chilled Water System

30.2.1.4.1 Five (5) secondary chilled water circulating pumps.

30.2.1.4.2 Chilled water expansion tanks.

30.2.1.4.3 Four primary chilled water pumps, 1200 gpm @ 80Ft. head.

30.2.1.5 Condenser Water System

30.2.1.5.1 Four Cell 1500 gpm cooling towers @ 96 F to 86 F.

30.2.1.5.2 Four 50 HP each cooling tower fan motors.

30.2.1.5.3 Four (4) Ceramic/cellular w/ 3' PVC tower cell fill. (500 tons Ea.).

30.2.1.5.4 Four (4) chilled water circulating pumps.

30.2.1.5.5 Four (4) chilled water circulation pumps, horizontal split case.

30.2.1.5.6 One (1) Condenser water filter system.

30.2.1.6 Refrigerant Recovery Unit - One (1) ¾ HP Low pressure recovery unit.

30.2.1.7 Condenser Tube Cleaner - One (1) pneumatic condenser tube cleaner.

30.2.1.8 Compressed Air Systems

30.2.1.8.1 Two (2) twin air compressor.

30.2.1.8.2 Air dryer.

30.3 *(HOU) Main Terminal and Concourse Areas*

30.3.1 The (HOU) Main Terminal Building houses the (HOU) Central Plant. The Main Terminal Building handles Ticketing and Baggage and presents access to Concourses A, and C. These concourses were built at separate times and have been expanded to and renovated within a number of times. Air handling systems currently serving the upper and lower terminal areas are principally constant volume and multi-zone types. For most multi-zone units, the Mechanical Rooms are a common return plenum. Newer air handling units use ducted returns. Units installed in recent years including the baggage claim areas, west end, and east end ramps are in good condition.

30.3.2 Contractor shall operate and maintain all existing HVAC systems and equipment in or associated with the Terminal and Concourses, plus other Remote Facilities. The environmental systems utilized in the Terminal at (HOU) employ many different types of air conditioning systems, heating and ventilating units, het transfer systems, etc. Contractor shall minimize exhaust air requirements and maximize outside air

intake requirements to minimize fumes and humidity. A detailed listing of Terminal and Concourse equipment is provided in The HVAC Equipment Inventory List Exhibit I.

30.4 *Existing (HOU) Terminal and Concourse Equipment*

30.4.1 The following is a general description of the HVAC equipment.

30.4.1.1 Air Handling Units/Filters.

30.4.1.1.1 Control Air Compressors.

30.4.1.1.2 Air Driers.

30.4.1.1.3 Exhaust/Circulating Fans.

30.4.1.1.4 Supply Fans.

30.4.1.1.5 Heating and Ventilating Units.

30.4.1.1.6 Hot Water Boilers.

30.4.1.1.7 Chilled Water Circulating Pumps.

30.4.1.1.8 Hot Water Circulating Pumps.

30.4.1.1.9 Outside Air Fans.

30.4.1.1.10 Exhaust Fans for Inside of Terminal Areas.

30.4.1.1.11 Unitary DX HVAC Equipment.

30.4.1.1.12 Fan Coil Units.

30.4.1.1.13 Air Curtains.

30.4.1.1.14 Air Distribution Devices.

30.4.2 (HOU) Energy Management and Control.

30.4.3 Existing Control Systems:

30.4.3.1 Existing Controls are a combination of electric/pneumatic and Metasy's DDC system. Some of these controls will all be demolished as a part of the renovation and expansion projects. Contractor shall maintain existing controls and make adjustments as required to make the construction phasing, sequencing and transitions as painless as possible. Contractor shall work with the construction Contractors to assure that existing controls are left in service until new controls are ready for service.

30.4.4 New Control Systems:

30.4.4.1 Bac-net protocols of Local Intelligent Control Panels are in place at (HOU) for each air handling system, the chillers, and heat exchangers. The local intelligent panels have stand-alone capability, and contain all programs necessary for equipment operation. The local intelligent panels will be able to interface with the centralized control system.

30.4.4.2 The control system is an open protocol BACnet Building Automation and Control System, which includes UES and Alerton. Included in the Hardware for the system is EMI/RFI remediation in component and control panel selection and in construction procedures. HAS requires all systems not BACnet to provide Owner release of the Propriety Protocol and to have a gateway for permitting full communication capabilities. Specific controls systems include:

30.4.4.2.1 Chiller Controls

The factory installed unit mounted electronic control panel controls the chiller operation and provide for the safe operation of the chiller if the following conditions are encountered:

30.4.4.2.1.1 Cold condenser start.

30.4.4.2.1.2 Running with hot condenser water.

30.4.4.2.1.3 Low condenser water flow.

30.4.4.2.1.4 Hot evaporator start.

30.4.4.2.1.5 Return from momentary power losses in less than 1 minute.

30.4.4.2.2 Control panel is able to control the chiller's operation through diagnostics and diagnostic history that are time/date stamped. Diagnostics include among many others (1) sensor and switch faults, (2) excessive purge activity, (3) overload trips, (4) loss of flows, (5) high motor winding temperature.

30.4.4.2.3 The control panel is able to communicate with a BACnet Compatible Building Automation System.

30.4.4.2.4 Pump Control

The BACnet Compatible Energy Management and Control System for the primary variable speed pump operation will be capable of performing the following:

30.4.4.2.4.1 Alternating pumps.

30.4.4.2.4.2 Staging pumps.

30.4.4.2.4.3 Controlling AFD speed.

30.4.4.2.4.4 Monitoring of motor performance.

30.4.4.2.4.5 PID functions and set point modifications.

30.4.4.2.4.6 Energy management through a de-coupled system.

30.5 HVAC Air Side Systems Controls

30.5.1 Variable Air Volume Air Handling Units includes a factory furnished and mounted direct digital control panel for temperature control and energy management function. The system includes electronic actuators for coil control valves, dampers and duct pressure sensors for variable fan speed operation. DDC controllers are of modular construction and be able to withstand vibrations if mounted inside the AHU. The system is capable of controlling all the air handling unit operational parameters including:

30.5.1.1 Discharge temperature reset.

30.5.1.2 Supply fan state control and status.

30.5.1.3 Supply/return air temperature monitoring and control.

30.5.1.4 Outdoor air flow monitoring control. (For 100% O.A. Units).

30.5.1.5 Night set back, warm-up and cooling down cycles.

30.5.1.6 Space and duct humidity control.

30.5.1.7 AQ monitoring through CO2 sensors with O.A. control.

30.5.1.8 Variable frequency drives control from static pressure transducer.

30.5.1.9 Optimum start/stop, soft start.

30.5.1.10 Fan over pressurization safety switch.

30.5.1.11 Smoke control functions.

30.5.1.12 Chilled and hot water valves control.

30.5.1.13 Fan Operation status.

30.5.1.14 Filter status.

30.6 *Inter-operability with BACnet-Compatible Building Management Systems*

30.6.1 Constant Volume Air Handling Units are controlled by a general type direct digital control system for temperature control and energy management functions. DDC controllers are of modular construction and be able to withstand vibrations if mounted inside the AHU.

30.6.2 Variable Air Volume Modules are controlled using a general type direct digital control system. Individual space temperature sensors as part of a sensor group will be used as an input for a master zone controller.

30.7 *Compressor Air System*

30.7.1 The existing air compressor is providing air for the existing pneumatic control systems.

30.8 Performance Requirements – (HOU) Main Terminal and Concourses.

30.8.1 General – The Terminal Building is supplied primary heating and cooling mediums from the Central Plant facility. The systems are designed to maintain 74 °F ± 2°F indoor temperature through wide variations of outdoor temperature utilizing chilled and hot water. The mediums are conveyed through various piping throughout the terminal. The system should be capable of supplying chilled water at 42°F on demand with no less than 42.5°F at the coil, and hot water should be delivered at a temperature of 165°F. Hot water for domestic use and kitchen use is converted by shell and tube heat exchangers. HAS will select Primary and Domestic Hot Water Temperature setting. Contractor shall maintain all primary water, air, and secondary air systems to meet design performance requirements.

30.8.2 Special Conditions

30.8.2.1 HVAC Design Conditions. Carrier E20-11 cooling load calculation program was used to calculate the building cooling/heating block load. The air conditioning system is designed to maintain the specified indoor conditions at the specified outdoor weather conditions.

Outdoor Conditions

Summer:	97° F DB	77° F WB
Winter:	28° F DB	

These temperatures are based on ASHRAE 1% design conditions.

Indoor Conditions

Area Designation	Cooling RH Control	Heating RH Control
Concourses, Baggage Claim, Gates, Ticketing	74°Fdb±1°F No RH Control	74°Fdb±1°F No RH Control
Office & Other Areas	74°Fdb±1°F 50% RH±5%	74°Fdb±1°F No RH Control
Mechanical Rooms	104°F (Max) No RH Control	60°F DB No RH Control

The Total Estimated Building Cooling Loads:

Ticketing Building Lower (Level 1)	650 tons
Ticketing Building Upper (Level 2)	450 tons
Central Concourse	1,150 tons
Central Concourse expansion –	100 tons

Bridge	50 tons
Total	2,400 tons

30.8.2.2 A central dedicated ventilation unit will handle transmission and internal loads. Unit is a modular double skin construction complete with a centrifugal or airfoil supply fan section, cooling coil section with copper coil/copper fin construction, a heating coil section with copper coil/copper fin construction, an access door section wide enough to allow for adequate maintenance, a filter section comprising a 2" thick 30% efficiency pre-filter section, an electric excitation field and a 12" thick 85% efficiency cartridge filter, and a mixing box with O.A. measuring station (VAV units only).

30.8.2.3 An airflow measuring probe station is mounted on the supply ducts to provide for flow balancing and measuring.

30.8.2.4 A dedicated outdoor air handling unit (O.A. AHU) will handle the outside air sensible and latent loads. This unit is of modular double skin construction complete with copper coil/copper fin cooling coil section, a copper coil/copper fin heating section, an 85% efficiency 12" cartridge filter section, and a centrifugal fan supply section. A 2-speed fan motor is used and controlled through return air duct mounted CO_2 sensors. The O.A. AHU is complete with unit-mounted starters and DDC control panel for its operation. Two-way modulating temperature control valves with electric actuators and automatic flow control valves are used to control chilled water flow. Three-way control valves are used on the most remote units in the loop to prevent loss of flow conditions.

30.8.2.5 Outbound Baggage Handling Areas. Fresh outside air from a clean source are carried and supplied to dedicated O.A. AHUs in the baggage handling areas. Air will then be treated and tempered to a minimum temperature of 65°F in summer and maximum of 75°F in winter and supplied through a duct distribution system to spot cool the work areas. Drum louvers with adjustable cylindrical drums are used to adjust for season change air pattern distribution. Air delivery will be at a speed of 1,500 FPM. Redundancy will be used as each conveyor belt is supplied by two overhead supply air ducts from two independent units.

30.8.2.6 Baggage Claim Conveyor Belt Area. Air curtains are installed on all baggage claim area conveyor belts to prevent air infiltration from the tug drive area. Air curtains are interlocked with the security door operation.

30.8.2.7 Ventilation for Toilet Rooms. Toilet room ventilation is designed to come from adjacent areas. Hence, Contractor shall maintain toilet areas at negative pressure conditions at all times. The air requirement for ventilation will be the highest of the following:

30.8.2.7.1 CFM/sq. ft. of toilet room floor areas.

30.8.2.7.2 15 ACH in the toilet room areas.

30.8.2.7.3 50 CFM/WC or 50 CFM/Urinal.

30.8.2.8 Backwardly inclined in-line centrifugal exhausters are used to push the air outdoors. For VAV air handling systems, Contractor shall coordinate operation of the exhausters with the air handling system operation to avoid building loss of pressurization problems.

30.8.2.9 Concession Kitchen Ventilation. Make-up air provided for the concession areas exhaust will not be provided from adjoining spaces. Concession vendors will supply all make-up air quantity required for the kitchen exhaust equipment. Vendors will supply the heating, ventilation and air condition equipment. Chilled/heating water supply and return tapings will be only provided for concession vendor's use. To provide for tenant billing, energy or BTU meters will be used for each independent tenant. Flow meter and temperature sensors in the supply/return piping are installed and connected to the BTU meter.

30.9 *(HOU) - BUILDING AT 8800 PAUL B. KOONCE BOULEVARD*

30.9.1 HVAC Equipment – Building at 8800 Paul B. Koonce Boulevard

Contractor shall operate and maintain all HVAC systems in or associated with the building at 8800 Paul B. Koonce Boulevard (former FAA facility). A detailed listing of Equipment is provided in The HVAC Equipment Inventory List Exhibit I. HVAC equipment includes, but is not limited to, the following:

30.9.1.1 Packaged Chiller.

30.9.1.2 Air Cooled Condensing Unit.

30.9.1.3 Air Handling Units.

30.9.1.4 Air Handling Unit Filters.

30.9.1.5 Air Handling Unit Interlocks.

30.9.1.6 Ventilating Fans with thermostats, speed controls, etc.

30.9.1.7 Fire Dampers.

30.9.1.8 Electric Duct Heaters.

30.9.1.9 Gas-Fired Hot Water Boiler Unit.

30.9.1.10 Air Distribution Devices.

30.9.1.11 Volume Dampers.

30.9.2 Performance Requirements – Building at 8800 Paul B. Koonce Boulevard

30.9.2.1 Contractor shall operate the HVAC system to maintain a year-round interior ambient of 74 ± 2 degrees F temperature and 50% + 5% relative humidity within the building envelope.

30.10 *(HOU) Remote Buildings/Facilities*

30.10.1 Contractor shall maintain the HVAC equipment in several remote buildings and structures at the Airport. Remote buildings and structures that include, but are not limited to, the following.

30.10.1.1 Public Safety/TSA/H.P.D. and Facilities Administration buildings.

30.10.1.2 Fire Station No. 81.

30.10.1.3 Airfield & Grounds Building.

30.10.1.4 Vehicle Maintenance Shop.

30.10.1.5 North Ramp Electrical Vault.

30.10.1.6 South Ramp Electrical Vault.

30.10.1.7 Cab Drivers' Break Room.

30.10.1.8 Parking Garage Ground Transport Building.

30.10.1.9 Electrical Hangar.

30.10.1.10 Guard Shacks (N7 & N26).

30.10.1.11 Fuel Farm A/C Unit.

30.10.1.12 All domestic water pumps.

30.10.1.13 All circulating pumps.

30.11 *Remote HVAC Equipment*

30.11.1 Contractor shall operate and maintain all HVAC systems in or associated with the remote buildings and structures. A detailed listing of Remote Equipment is provided in The HVAC Equipment Inventory List Exhibit I. Remote HVAC equipment includes, but is not limited to, the following:

30.11.1.1 Air Cooled Condenser Units.

30.11.1.2 Air Handler Units.

30.11.1.3 Fan Coil Units.

30.11.1.4 Gas Flow Furnaces.

30.11.1.5 Forced Air Furnaces.

30.11.1.6 Boiler.

30.11.1.7 Air Compressor w/air dryer.

30.12 *Performance Requirements – Remote Facilities*

30.12.1 The HVAC system should maintain a year-around interior ambient of 75 degrees temperature and 50% relative humidity within the building envelope.

30.13 *Miscellaneous DX Equipment at (HOU)*

30.13.1 The (HOU) airport system includes certain buildings housing both HAS employees and airport tenants that fall outside the chilled water closed loop system, the building at 8800 Paul B. Koonce Boulevard, and Remote Buildings/Facilities. The designation (DX) in these documents identify those specific stand alone systems for which O&M HVAC services for which Contractor is responsible to operate and maintain. The systems in these facilities range from stand-alone 3/4-ton window units to complete packaged heating and cooling units.

30.14 *Miscellaneous (DX) HVAC Equipment*

30.14.1 Contractor shall maintain certain DX HVAC equipment. A detailed listing of Miscellaneous (DX) HVAC Equipment is provided in The HVAC Equipment Inventory List, Exhibit I.

30.14.1.1 Window Units.

30.14.1.2 Packaged Units.

30.14.1.3 Roof Unit.

30.14.1.4 Blower Unit.

30.15 *Performance Requirements - Miscellaneous (DX)*

30.15.1 The HVAC system should maintain a year-around interior ambient of 74°F + 1°F temperature and in summer a 50% + 5% relative humidity within the building envelope.

30.16 *(HOU) Offices under the East and West U-Ramp*

30.16.1 The HVAC equipment comprised within vacant offices under the East U-Ramp and PPM offices under the West U-Ramp are fan coil units. A detailed list of the equipment to be maintained is provided in The HVAC Equipment Inventory List, Exhibit I.

31.0 ESTIMATED RENOVATION, UPGRADE, EXPANSION AND DEMOLITION WORK:

31.1 *(IAH)*

31.1.1 Project 621- Central Plant expansion - Construction to provide up to two (2) 50,000 pounds per hour boilers and associated equipment, pumps etc. and up to one 3,000 ton electric chiller and associated equipment, pumps etc. (Estimate project will start within 2-years).

31.1.2 Project 500N- T-D Renovations- Construction to remove existing Andover DDC control system and replace with a Bac-net non proprietary system. (Estimate project will start within 4-years).

31.1.2.1 Exhaust and pumping systems may be upgraded to include existing AHU'S.

31.1.3 Project 520- ASC expansion including new Fleet offices and work bays. New equipment will include heaters, DX units, AHU's etc. (Estimate project will start within 5-years).

31.2 *(HOU)*

31.2.1 Project 445- A&G expansion including a new building to house Grounds personnel, offices and a new Fleet building. New equipment will include heaters, DX units, Air Handling Units (AHU) etc. (Estimate project will start within 4-years)

31.2.2 Current expansion of the Central concourse on the East side is ongoing and includes new AHU's, pumps, etc.

31.3 *(EFD)-None*

32.0 CONTRACTOR RESPONSIBILITY DURING IMPLEMENTATION OF NEW FACILITIES AND/OR EQUIPMENT (IAH), (HOU) & (EFD)

32.1 As part of the Basic Services, Contractor shall cooperate with HAS and or/Contractor to meet operational and capacity requirements during renovations, upgrades, expansion, and demolitions for any future projects. Contractor shall provide optimum system operations during any construction /project work to meet additional cooling and heating load requirements from on-line facilities, systems, and equipment as new systems and equipment are being readied to come on line for full cooling and heating operating service.

32.2 Upon issuance of a certificate of substantial completion and/or beneficial use and the equipment is put into revenue service the Contractor shall take full responsibility of equipment maintenance and manage any warranties in effect.

33.0 ENERGY MANAGEMENT - (IAH), (HOU) & (EFD)

33.1 At the inception of Project 621, any payments will cease for Energy Management Savings. After completion of Project 621, an eighteen (18) month base line shall be established with the following guidelines below. Estimated Project 621 completion is thirty (30) months.

33.1.1 Contractor shall continue monitoring the natural gas consumption once the new boilers are fully operational, with no shared savings. This would start the eighteen (18) month period for the development of a baseline for gas consumption.

33.1.2 The second major portion of the program will be the installation of the new chiller. Contractor shall start tracking the operation through UtiliVisor system. This would start the eighteen (18) month period for the development of a baseline for electric consumption.

33.1.3 Contractor shall continue to track all utilities in the central plant and produce a cost avoidance report with no request for shared savings during the eighteen (18) month periods. The reports shall be sent quarterly to HAS Management for review.

33.1.4 At the end of eighteen (18) month periods, Contractor shall submit new baseline models of the natural gas and electric consumption to HAS for review and approval. At this time, Contractor shall work with the new equipment to save additional energy dollars that would become available for shared savings, if any, as defined in the Agreement, with 80% to the City and 20% to Contractor.

33.2 *Ways in managing energy consumption:*

33.2.1 Operating the chiller equipment and system in a manner to utilize the energy source (gas for steam turbine drive versus electric drive chillers), which produces the lowest cost per ton. (IAH only).

33.2.2 Optimizing energy usage, balancing operating hours on all equipment, and determining optimum modes of operations for all HVAC SYSTEMS.

33.2.3 Exploring Load share plans.

33.2.4 Evaluating energy usage and identifying opportunities for efficiencies/savings.

33.2.5 Maintaining reserve cooling/heating capacities and balancing equipment operating hours.

33.2.6 Identifying and implementing additional energy conservation strategies.

33.2.7 Periodic exercising all major equipment in the Central Plants.

33.2.8 Operating and maintaining HVAC SYSTEMS and monitoring and controlling performance related items at optimum efficiency for control including but not limited to the following:

33.2.8.1 Management control system(s).

33.2.8.2 Fuel/Air ratio (excess air) in boiler firing.

33.2.8.3 Blow-off and Blow-downs of boilers.

33.2.8.4 Blow-down on cooling tower systems.

33.2.8.5 De-aerator venting and operating pressure.

33.2.8.6 Operation of constant and variable speed parallel pumping units.

33.2.8.7 Operation of cooling towers and fans.

33.2.8.8 Centrifugal chiller oil analysis.

33.2.8.9 Water softening system.

33.2.8.10 Monitoring of Cathodic protection.

33.3 Propose shared savings/incentives that includes, but is not limited to:

33.3.1 Methods of tracking and identifying savings.

33.3.2 Auditing utility bills.

33.4 Contractor shall reduce energy usage without adversely impacting tenant comfort using the following approaches:

33.4.1 A comprehensive maintenance program that helps to ensure that equipment and systems are running at peak efficiency.

33.4.2 High efficiency rated replacement parts.

33.4.3 BAS control software must be regularly adjusted to provide maximum benefit from free cooling and outside air-reset technologies.

EXHIBIT "B"

FEE SCHEDULE

EXHIBIT B – FEE SCHEDULE

Contractor shall furnish all necessary labor, equipment, material, supplies, personnel, services, and all activity necessary for, or incidental, to perform the Work as specified in the Agreement.

All quantities listed are estimated quantities for budgetary purposes only. The actual quantities may be higher or lower than any estimates, and Contractor shall be paid only for actual Work performed, subject to prior HAS direction and approval.

YEARS (1- 5) PRICE SHEET TOTAL SUMMARY

YEAR ONE RATES – PRICE SHEET TOTAL SUMMARY

I-a.	Total Basic Services (IAH)	$3,820,866.85
I-b.	Total Basic Services (HOU)	$ 832,099.45
I-c.	Total Basic Services (EFD)	$ 61,110.03
II-a.	Total Other Work/Services (IAH)	$ 707,250.00
II-b.	Total Other Work/Services (HOU)	$ 213,336.00
II-c.	Total Other Work/Services (EFD)	$ 94,668.00

TOTAL BASIC SERVICES & OTHER WORK /SERVICES YEAR ONE RATES (IAH)(HOU)&(EFD) **$5,729,330.32**

YEAR TWO RATES - PRICE SHEET TOTAL SUMMARY

I-a.	Total Basic Services (IAH)	$3,712,967.12
I-b.	Total Basic Services (HOU)	$ 835,023.88
I-c.	Total Basic Services (EFD)	$ 55,908.30
II-a.	Total Other Work/Services (IAH)	$ 724,791.00
II-b.	Total Other Work/Services (HOU)	$ 217,056.10
II-c.	Total Other Work/Services (EFD)	$ 96,492.05

TOTAL BASIC SERVICES & OTHER WORK /SERVICES YEAR TWO RATES (IAH)(HOU)&(EFD) **$5,642,238.44**

YEAR THREE RATES - PRICE SHEET TOTAL SUMMARY

I-a.	Total Basic Services (IAH)	$3,869,715.55
I-b.	Total Basic Services (HOU)	$ 868,424.83
I-c.	Total Basic Services (EFD)	$ 58,144.63
II-a.	Total Other Work/Services (IAH)	$ 742,963.48
II-b.	Total Other Work/Services (HOU)	$ 220,910.12
II-c.	Total Other Work/Services (EFD)	$ 98,381.76

TOTAL BASIC SERVICES & OTHER WORK / SERVICES YEAR THREE RATES (IAH)(HOU)&(EFD) **$5,858,540.36**

EXHIBIT B – FEE SCHEDULE

YEAR FOUR (OPTION YEAR 1) RATES – PRICE SHEET TOTAL SUMMARY

I-a.	Total Basic Services (IAH)	$4,032,733.91
I-b.	Total Basic Services (HOU)	$ 903,161.83
I-c.	Total Basic Services (EFD)	$ 60,470.42
II-a.	Total Other Work/Services (IAH)	$ 761,790.16
II-b.	Total Other Work/Services (HOU)	$ 229,986.18
II-c.	Total Other Work/Services (EFD)	$ 100,339.51

TOTAL BASIC SERVICES & OTHER WORK /SERVICES OPTION YEAR 1 RATES (IAH)(HOU)&(EFD) **$6,088,482.01**

YEAR FIVE (OPTION YEAR 2) RATES - PRICE SHEET TOTAL SUMMARY

I-a.	Total Basic Services (IAH)	$4,202,273.02
I-b.	Total Basic Services (HOU)	$ 939,288.30
I-c.	Total Basic Services (EFD)	$ 62,889.24
II-a.	Total Other Work/Services (IAH)	$ 781,294.61
II-b.	Total Other Work/Services (HOU)	$ 229,039.38
II-c.	Total Other Work/Services (EFD)	$ 102,367.73

TOTAL BASIC SERVICES & OTHER WORK /SERVICES OPTION YEAR 2) RATES (IAH)(HOU)&(EFD) **$6,317,152.27**

FIVE YEAR GRAND TOTAL	**$29,635,743.40**

EXHIBIT B – FEE SCHEDULE

I-a. YEAR ONE – (IAH) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3, & A-4)	$283,168.33	(12)	$3,398,019.94
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 20,260.44	(12)	$ 243,125.23
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 13,336.18	(12)	$ 160,034.18
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integration, etc.)	$ 1,640.63	(12)	$ 19,687.50
	(IAH) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$3,820,866.85**

EXHIBIT B – FEE SCHEDULE

II-a. YEAR ONE – (IAH) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (IAH) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	1,650	X	$76.00	=	$125,400.00
	b. After Normal Work Hours	800	X	$98.80	=	$ 79,040.00
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	1,600	X	$115.00	=	$184,000.00
	b. After Normal Work Hours	300	X	$149.50	=	$ 44,850.00
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	450	X	$76.00	=	$ 34,200.00
	b. After Normal Work Hours	200	X	$98.80	=	$ 19,760.00
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$487,250.00**

EXHIBIT B – FEE SCHEDULE

B. ESTIMATED (IAH) OTHER WORK/SERVICES / SUBCONTRACTS / MATERIALS / SUPPLIES
(Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$ 200,000.00	10 %	$ 220,000.00

TOTAL ESTIMATED (IAH) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) **$707,250.00**

EXHIBIT B – FEE SCHEDULE

I-b. YEAR ONE – (HOU) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 And A-4)	$58,776.94	(12)	$705,323.31
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 7,682.56	(12)	$ 92,190.71
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 2,400.87	(12)	$ 28,810.43
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$ 481.25	(12)	$ 5,775.00
	(HOU) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$832,099.45**

II-b. YEAR ONE – (HOU) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (HOU) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour/Unit	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	500	X	$ 76.00	=	$ 38,000.00
	b. After Normal Work Hours	130	X	$ 98.80	=	$ 12,844.40
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	200	X	$115.00	=	$ 23,000.00
	b. After Normal Work Hours	120	X	$149.50	=	$ 17,940.00
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	100	X	$ 76.00	=	$ 7,600.00
	b. After Normal Work Hours	40	X	$ 98.80	=	$ 3,952.00
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$103,336.00**

B. ESTIMATED (HOU) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES (Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$ 100,000	10 %	$110,000

TOTAL ESTIMATED (HOU) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) **$213,336.00**

EXHIBIT B – FEE SCHEDULE

I-c. YEAR ONE – (EFD) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 and A-4)	$ 3,874.54	(12)	$46,494.43
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 846.09	(12)	$10,153.10
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 306.25	(12)	$ 3,675.00
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$ 65.63	(12)	$ 787.50
	(EFD) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$61,110.03**

II-c. YEAR ONE – (EFD) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (EFD) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour/Unit	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	310	X	$76.00	=	$23,560.00
	b. After Normal Work Hours	30	X	$98.80	=	$ 2,964.00
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	140	X	$115.00	=	$16,100.00
	b. After Normal Work Hours	20	X	$149.50	=	$ 2,990.00
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	60	X	$76.00	=	$ 4,560.00
	b. After Normal Work Hours	5	X	$98.80	=	$ 494.00
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$50,668.00**

B. ESTIMATED (EFD) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES (Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$40,000	10 %	$44,000

TOTAL ESTIMATED (HOU) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) $94,668.00

EXHIBIT B – FEE SCHEDULE

I-a. YEAR TWO – (IAH) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3, & A-4)	$ 272,908.14	(12)	$3,274,897.72
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 20,989.81	(12)	$251,877.74
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 13,816.28	(12)	$165,795.41
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integration, etc.)	$ 1,699.69	(12)	$20,396.25
	(IAH) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$3,712,967.12**

II-a YEAR TWO – (IAH) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (IAH) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	1,650	X	$ 78.74	=	$129,914.40
	b. After Normal Work Hours	800	X	$102.36	=	$ 81,885.44
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	1,600	X	$119.14	=	$190,624.00
	b. After Normal Work Hours	300	X	$154.88	=	$ 46,464.60
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	450	X	$ 78.74	=	$ 35,431.20
	b. After Normal Work Hours	200	X	$102.36	=	$ 20,471.36
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$504,791.00**

EXHIBIT B – FEE SCHEDULE

B. ESTIMATED (IAH) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES
(Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$200,000	10 %	$220,000

TOTAL ESTIMATED (IAH) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) **$724,791.00**

I-b. YEAR TWO – (HOU) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 And A-4)	$58,807.16	(12)	$705,685.94
A-2	Operation and Maintenance of Direct Digital Control Systems.	$7,959.13	(12)	$95,509.57
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$2,320.46	(12)	$27,845.47
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$498.58	(12)	$5,982.90
	(HOU) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$835,023.88**

II-b. YEAR TWO – (HOU) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (HOU) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour/Unit	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	500	X	$ 78.74	=	$39,368.00
	b. After Normal Work Hours	130	X	$102.36	=	$13,306.38
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	200	X	$119.14	=	$23,828.00
	b. After Normal Work Hours	120	X	$154.88	=	$18,585.84
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	100	X	$ 78.74	=	$ 7,873.60
	b. After Normal Work Hours	40	X	$102.36	=	$ 4,094.27
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$107,056.10**

B. ESTIMATED (HOU) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES (Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$100,000	10 %	$110,000

TOTAL ESTIMATED (HOU) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) $217,056.10

I-c. YEAR TWO – (EFD) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 and A-4)	$ 3,401.85	(12)	$40,822.25
A-2	Operation and Maintenance of Direct Digital Control Systems.	$876.55	(12)	$ 10,518.62
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$317.28	(12)	$3,807.30
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$63.34	(12)	$760.14
	(EFD) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$55,908.30**

II-c. YEAR TWO – (EFD) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (EFD) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour/Unit	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	310	X	$ 78.74	=	$24,408.16
	b. After Normal Work Hours	30	X	$102.36	=	$ 3,070.70
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	140	X	$119.14	=	$16,679.60
	b. After Normal Work Hours	20	X	$154.88	=	$ 3,097.64
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	60	X	$ 78.74	=	$ 4,724.16
	b. After Normal Work Hours	5	X	$102.36	=	$ 511.78
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$52,492.05**

B. ESTIMATED (EFD) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES (Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$40,000	10 %	$44,000

TOTAL ESTIMATED (HOU) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) $96,492.05

I-a. YEAR THREE – (IAH) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3, & A-4)	$284,656.31	(12)	$3,415,875.66
A-2	Operation and Maintenance of Direct Digital Control Systems.	$21,745.44	(12)	$260,945.34
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$14,313.67	(12)	$171,764.04
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integration, etc.)	$1,760.88	(12)	$21,130.52
	(IAH) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$3,869,715.56**

II-a YEAR THREE – (IAH) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (IAH) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	1,650	X	$ 81.57	=	$134,591
	b. After Normal Work Hours	800	X	$106.04	=	$ 84,833
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	1,600	X	$123.43	=	$197,486
	b. After Normal Work Hours	300	X	$160.46	=	$ 48,137
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	450	X	$ 81.57	=	$ 36,707
	b. After Normal Work Hours	200	X	$106.04	=	$ 21,208
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$522,963**

EXHIBIT B – FEE SCHEDULE

B. ESTIMATED (IAH) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES
(Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$200,000	10 %	$220,000

TOTAL ESTIMATED (IAH) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) **$742,963.48**

I-b. YEAR THREE – (HOU) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 And A-4)	$61,193.27	(12)	$734,319.25
A-2	Operation and Maintenance of Direct Digital Control Systems.	$8,245.66	(12)	$98,947.92
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$2,413.28	(12)	$28,959.38
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$516.52	(12)	$6,198.28
	(HOU) BASIC SERVICES TOTAL ITEMS (*A-1 Thru A-4*)			**$868,424.83**

EXHIBIT B – FEE SCHEDULE

Contractor shall furnish all necessary labor, equipment, material, supplies, personnel, services, and all activity necessary for, or incidental, to perform the Work as specified in the Agreement.

All quantities listed are estimated quantities for budgetary purposes only. The actual quantities may be higher or lower than any estimates, and Contractor shall be paid only for actual Work performed, subject to prior HAS direction and approval.

PRICE SHEET TOTAL SUMMARY

PRICE SHEET TOTAL SUMMARY

I-a.	Total Basic Services (IAH)	$3,820,866.85	
I-b.	Total Basic Services (HOU)	$ 832,099.45	
I-c.	Total Basic Services (EFD)	$ 61,110.02	
	TOTAL BASIC SERVICES (IAH), (HOU) & (EFD)		$4,714,076.32
II-a.	Total Other Work/Services (IAH)	$ 707,250.00	
II-b.	Total Other Work/Services (HOU)	$ 213,336.00	
II-c.	Total Other Work/Services (EFD)	$ 94,668.00	
	TOTAL OTHER WORK/SERVICES (IAH), (HOU) & (EFD)		$1,015,254.00
	TOTAL BASIC SERVICES & OTHER WORK /SERVICES YEAR ONE RATES (IAH)(HOU)&(EFD)		$5,729,330.32

EXHIBIT B – FEE SCHEDULE

I-a. (IAH) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3, & A-4)	$283,168.33	(12)	$3,398,019.94
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 20,260.44	(12)	$ 243,125.23
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 13,336.18	(12)	$ 160,034.18
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integration, etc.)	$ 1,640.63	(12)	$ 19,687.50
	(IAH) BASIC SERVICES TOTAL ITEMS *(A-1 Thru A-4)*			$3,820,866.85

EXHIBIT B – FEE SCHEDULE

II-a. (IAH) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (IAH) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	1,650	X	$76.00	=	$125,400.00
	b. After Normal Work Hours	800	X	$98.80	=	$ 79,040.00
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	1,600	X	$115.00	=	$184,000.00
	b. After Normal Work Hours	300	X	$149.50	=	$ 44,850.00
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	450	X	$76.00	=	$ 34,200.00
	b. After Normal Work Hours	200	X	$98.80	=	$ 19,760.00

Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)* **$487,250.00**

EXHIBIT B – FEE SCHEDULE

B. ESTIMATED (IAH) OTHER WORK/SERVICES / SUBCONTRACTS / MATERIALS / SUPPLIES
(Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$ 200,000.00	10 %	$ 220,000.00

TOTAL ESTIMATED (IAH) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) $707,250.00

EXHIBIT B – FEE SCHEDULE

I-b. (HOU) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 And A-4)	$58,776.94	(12)	$705,323.31
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 7,682.56	(12)	$ 92,190.71
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 2,400.87	(12)	$ 28,810.43
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$ 481.25	(12)	$ 5,775.00
	(HOU) BASIC SERVICES TOTAL ITEMS *(A-1 Thru A-4)*			$832,099.45

EXHIBIT B – FEE SCHEDULE

II-b. (HOU) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (HOU) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour/Unit	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	500	X	$ 76.00	=	$ 38,000.00
	b. After Normal Work Hours	130	X	$ 98.80	=	$ 12,844.40
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	200	X	$115.00	=	$ 23,000.00
	b. After Normal Work Hours	120	X	$149.50	=	$ 17,940.00
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	100	X	$ 76.00	=	$ 7,600.00
	b. After Normal Work Hours	40	X	$ 98.80	=	$ 3,952.00

Total Estimated Other Work / Services Labor Annual Costs **$103,336.00**
(add items 1 - 3)

EXHIBIT B – FEE SCHEDULE

B. ESTIMATED (HOU) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES (Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$ 100,000	10 %	$110,000

TOTAL ESTIMATED (HOU) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) **$213,336.00**

EXHIBIT B – FEE SCHEDULE

I-c. (EFD) BASIC SERVICES

		Cost per Month	(x)	Cost per Year
A-1	HVAC SYSTEMS Operation and Maintenance. (Includes all Basic Services specified in the Agreement with the exception of the following individually priced Basic Services items, A-2, A-3 and A-4)	$ 3,874.54	(12)	$46,494.42
A-2	Operation and Maintenance of Direct Digital Control Systems.	$ 846.09	(12)	$10,153.10
A-3	Water Treatment & Corrosion Testing (Operate, Maintain, Chemicals, Treat, Test. etc)	$ 306.25	(12)	$ 3,675.00
A-4	Maintenance Management System (MMS) (Provide, Install, Code, Integrations, etc.)	$ 65.63	(12)	$ 787.50
	(EFD) BASIC SERVICES TOTAL ITEMS *(A-1 Thru A-4)*			**$61,110.02**

EXHIBIT B – FEE SCHEDULE

II-c. (EFD) OTHER WORK/SERVICES

Other Work/Services may be required for the HVAC SYSTEMS to meet desired conditions and/or repairs not covered in the Basic Services of the Agreement. Any estimated quantities, labor hours, and remedial maintenance and supplies expenditures listed below are estimated amounts for Other Work/Services for each year of the Agreement. Consequently, the actual dollar amount for Other Work/Services may be higher or lower than the estimates, and the Contractor shall only be paid for actual work performed, subject to City direction and approval. **If Other Work/Services are performed by the on-site crew in conjunction with their regular duties, Contractor shall not receive additional compensation for their labor.**

A. **Estimated (EFD) Other Work/ Services Labor** (Quantities are estimated for budget purposes only)

No.	Description	Est. Annual Labor Hours	X	Cost per Hour/Unit	=	Annual Cost
1.	HVAC MAINTENANCE MECHANIC					
	a. Normal Work Hours	310	X	$76.00	=	$23,560.00
	b. After Normal Work Hours	30	X	$98.80	=	$ 2,964.00
2.	DDC MAINTENANCE TECHNICIAN					
	a. Normal Work Hours	140	X	$115.00	=	$16,100.00
	b. After Normal Work Hours	20	X	$149.50	=	$ 2,990.00
3.	DX MAINTENANCE MECHANIC					
	a. Normal Work Hours	60	X	$76.00	=	$ 4,560.00
	b. After Normal Work Hours	5	X	$98.80	=	$ 494.00
	Total Estimated Other Work / Services Labor Annual Costs *(add items 1 - 3)*					**$50,668.00**

EXHIBIT B – FEE SCHEDULE

B. ESTIMATED (EFD) OTHER WORK/SERVICES SUBCONTRACTS / MATERIALS / SUPPLIES (Quantities are estimated for budget purposes only)

PRICES SHALL BE BASED ON THE CONTRACTOR'S ACTUAL COST PLUS THE FOLLOWING MARK UP PERCENTAGES:

ITEM	ESTIMATED ANNUAL COST	CONTRACTOR PERCENT MARK-UP	TOTAL ANNUAL ESTIMATED COST
MATERIALS	$40,000	10 %	$44,000

TOTAL ESTIMATED (HOU) OTHER WORK/SERVICES LABOR & MATERIAL ANNUAL COST (*add A & B*) $94,668.00

EXHIBIT "C"

EQUAL EMPLOYMENT OPPORTUNITY

1. The contractor, subcontractor, vendor, supplier, or lessee will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, or age. The contractor, subcontractor, vendor, supplier, or lessee will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, sex, national origin, or age. Such action will include, but not be limited to, the following: employment; upgrading; demotion or transfer; recruitment advertising; layoff or termination; rates of pay or other forms of compensation and selection for training, including apprenticeship. The contractor, subcontractor, vendor, supplier or lessee agrees to post in conspicuous places available to employees, and applicants for employment, notices to be provided by the City setting forth the provisions of this Equal Employment Opportunity Clause.

2. The contractor, subcontractor, vendor, supplier, or lessee states that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin or age.

3. The contractor, subcontractor, vendor, supplier, or lessee will send to each labor union or representatives of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contracting officer advising the said labor union or worker's representative of the contractor's and subcontractor's commitments under Section 202 of Executive Order No. 11246, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. The contractor, subcontractor, vendor, supplier, or lessee will comply with all provisions of Executive Order No. 11246 and the rules, regulations, and relevant orders of the Secretary of Labor or other Federal Agency responsible for enforcement of the equal employment opportunity and affirmative action provisions applicable and will likewise furnish all information and reports required by the Mayor and/or Contractor Compliance Officer(s) for purposes of investigation to ascertain and effect compliance with this program.

5. The contractor, subcontractor, vendor, supplier, or lessee will furnish all information and reports required by Executive Order No. 11246, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to all books, records, and accounts by the appropriate City and Federal Officials for purposes of investigations to ascertain compliance with such rules, regulations, and orders. Compliance reports filed at such times as directed shall contain information as to the employment practice policies, program, and work force statistics of the contractor, subcontractor, vendor, supplier, or lessee.

6. In the event of the contractor's, subcontractor's, vendor's, supplier's, or lessee's non-compliance with the non-discrimination clause of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and the contractor, subcontractor, vendor, supplier, or lessee may be declared ineligible for further City contracts in accordance with procedures provided in Executive Order No. 11246, and such other sanctions may be imposed and remedies invoked as provided in the said Executive Order, or by rule, regulation, or order of the Secretary of Labor, or as may otherwise be provided by law.

7. The contractor shall include the provisions of paragraphs 1-8 of this Equal Employment Opportunity Clause in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontractor or purchase order as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event the contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

8. The contractor shall file and shall cause his or her subcontractors, if any, to file compliance reports with the City in the form and to the extent as may be prescribed by the Mayor. Compliance reports filed at such times as directed shall contain information as to the practices, policies, programs, and employment policies and employment statistics of the contractor and each subcontractor.

EXHIBIT D

MWBE SUBCONTRACT TERMS

EXHIBIT II – ATTACHMENT "A": SCHEDULE OF M/WBE PARTICIPATION
SOLICITATION NO.: S33-T23961

DATE OF REPORT: December 5, 2011
NO.: S33-T23961

FORMAL BID TITLE: HVAC Operation and Maintenance Services for the Houston Airport System

NAME OE MINORITY/WOMEN SUBCONTRACTOR	AFFIRMATIVE ACTION DIVISION CERTIFICATION NO.	STREET ADDRESS AND CITY, STATE, ZIP CODE	TELEPHONE NO.	SCOPE OE WORK	AGREE PRICE
Tejas Office Products, Inc.	11-081091	1225 West 20th Street Houston, TX 77008-3315	713-864-6004 Ext.4522	Office Supplies	25,000.00
ACS Mechanical	11-3-6803	4822 Marywood Drive Spring, TX 77388	281-379-7933	HVAC Service	375,000.00
Independent A/C Refrigeration	NAICS-238220	12730 Robert E. Lee Road Houston, TX 77044	281-458-7722	HVAC Service	250,000.00
Tex Star Bearings	NAICS-423840	4025 Willowbend Blvd. Ste.307 Houston, TX 77025	713-731-7200	HVAC Parts	225,000.00
B&B Valves & Fittings	NAICS-423720	5224 Tidwell Road Houston, TX77016	713-633-3139	HVAC Parts	75,000.00

950,000.00
TOTAL. . . . . + Page 2 $ 5,015,834.02

M/WBE PARTICIPATION AMOUNT. . . . . $ 19 %

TOTAL BID AMOUNT. . . . . $ 32,599,317.74

EXHIBIT II – ATTACHMENT "A": SCHEDULE OF M/WBE PARTICIPATION
SOLICITATION NO.: S33-T23961

DATE OF REPORT: December 5, 2011
NO.: S33-T23961

FORMAL BID TITLE: HVAC Operation and Maintenance Services for the Houston Airport System

NAME OE MINORITY/WOMEN SUBCONTRACTOR	AFFIRMATIVE ACTION DIVISION CERTIFICATION NO.	STREET ADDRESS AND CITY, STATE, ZIP CODE	TELEPHONE NO.	SCOPE OE WORK	AGREE PRICE
Bradlink	10-11-10435	4501 Magnolia Cove Drive, Ste.201 Kingwood, TX 77345	281-361-5809	Labor	2,952,084.02
Houston Chem Safe	11-1-3742	8407 Braesdale Lane Houston, TX 77071	713-228-8282	Water Treatment	813,750.00
Abilities Unlimited	12-10-3110	507 N. Sam Houston Pkwy. East Ste.165 Houston, TX 77060	281-999-6300	Labor	1,100,000.00
Aus-Tex Electric	NAICS-238210	1525 Wilbuforce Street Houston, TX 77091	713-682-5809	Electrical Service/Materials	125,000.00
Office Effects	11-2-10990	1022 Wirt Road, Ste. 316 Houston, TX 77055	713-957-4700	Office Products	25,000.00

TOTAL. . . . . + Page 1 — 5,015,834.02 / $ 950,000.00

M/WBE PARTICIPATION AMOUNT. . . . . — $ 19 %

TOTAL BID AMOUNT. . . . . — $ 32,599,317.74

EXHIBIT II – ATTACHMENT "A" (CONTINUED): SCHEDULE OF M/WBE PARTICIPATION
SOLICITATION NO.: S33-T23961

IE YOU HAVE USED YOUR BEST EFFORTS TO CARRY OUT THE CITY'S M/WBE POLICY BY SEEKING SUBCONTRACTS AND SUPPLY AGREEMENTS WITH MINORITY AND WOMEN BUSINESS ENTERPRISES, YET FAILED TO MEET THE STATED PERCENTAGE GOAL OF THIS BID DOCUMENT, LIST BELOW YOUR GOOD FAITH EFFORTS EOR COMPLIANCE (DEFINITION OF REQUIREMENTS CAN BE OBTAINED THROUGH AFFIRMATIVE ACTION AT (713) 837-9000).
THE UNDERSIGNED WILL ENTER INTO A FORMAL AGREEMENT WITH THE MINORITY AND/OR WOMEN SUBCONTRACTORS AND SUPPLIERS LISTED IN THIS SCHEDULE CONDITIONED UPON AWARD OF A CONTRACT FROM THE CITY. **NOTE:** **ALL FIRMS LISTED ABOVE MUST BE CERTIFIED (OR ELIGIBLE FOR CERTIFICATION) BY THE AFFIRMATIVE ACTION DIVISION.** **THIS SCHEDULE OF MIWBE PARTICIPATION SHOULD BE RETURNED, IN DUPLICATE, WITH THE BID FORM.**

TDIndustries, Inc.

BIDDER COMPANY NAME

SIGNATURE OF AUTHORIZED OFFICER OR AGENT OF BIDDER

Bill Parten

NAME (TYPE OR PRINT)

Executive Vice President

TITLE

EXHIBIT II - ATTACHMENT "B": M/WBE LETTER OF INTENT
SOLICITATION NO.: S33-T23961

THIS AGREEMENT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT.

TO: **City of Houston**
City Purchasing Agent

MINORITY/WOMEN BUSINESS ENTERPRISE (M/WBE) AND SUPPLIER

LETTER OF INTENT

Contract Bid Number: S33-T23961

Bid Title: HVAC Operation & Maintenance Services for the Houston Airport System

Bid Amount: _____

M/WBE Participation Amount: $25,000.00 **M/WBE GOAL** 18%

1 Tejas Office Products, Inc. agrees to perform work/supply goods and/or
(Name of Minority/Women Business Enterprise)
services in connection with the above-named contract and TDIndustries, Inc. as:
Name of Prime Contractor

(a) _____ An Individual

(b) _____ A Partnership

(c) ✓ A Corporation

(d) _____ A Joint Venture

2 Tejas Office Products, Inc. status is confirmed by M/WBE Directory and/or designee made
(Name of Minority/Women Business Enterprise)
available through the City of Houston Affirmative Action Division. Certificate No.: 14-0[illegible]

3 TDIndustries, Inc. and Tejas Office Products, Inc.
(Name of Prime Contractor) **(Name of Minority/Women Business Enterprise)**
intend to work on the above-named contract in accordance with the M/WBE Participation Section of the City of Houston Contract Bid Provision.

The terms and conditions of Attachment "C" attached hereto are incorporated into this Letter of Intent for all purposes.

_____
Signed-Prime Contractor

Executive Vice President
Title

_____
Date

Stephen [illegible]
Signed-(Minority/Women Business Enterprise)

President
Title

June 4, 2014
Date

EXHIBIT II - ATTACHMENT "C": CERTIFIED M/WBE SUBCONTRACT TERMS
SOLICIATATION NO.: S33-T23961

Contractor shall insure that all subcontracts with M/WBE subcontractors and suppliers are clearly labeled "**THIS CONTRACT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT**" and contain the following terms:

1. Tejas Office Products, Inc. (M/WBE subcontractor) shall not delegate or subcontract more than 50% of the work under this subcontract to any other subcontractor or supplier without the express written consent of the City of Houston's Affirmative Action Director and/or designee ("the Director and/or designee")

2. Tejas Office Products, Inc. (M/WBE subcontractor) shall permit representatives of the City of Houston, at all reasonable times, to perform 1) audits of the books and records of the subcontractor, and 2) inspections of all places where work is to be undertaken in connection with this subcontract. Subcontractor shall keep such books and records available for such purpose for at least four (4) years after the end of its performance under this subcontract. Nothing in this provision shall affect the time for bringing a cause of action nor the applicable statute of limitations.

3. Within five (5) business days of execution of this subcontract, Contractor (prime contractor) and Subcontractor shall designate in writing to the Director and/or designee an agent for receiving any notice required or permitted to be given pursuant to Chapter 15 of the Houston City Code of Ordinances, along with the street and mailing address and phone number of such agent.

4. As conclude by the parties to this subcontract, and as evidenced by their signatures hereto, any controversy between the parties involving the construction or application of any of the terms, covenants or conditions of this subcontract shall, on the written request of one party served upon the other or upon notice by Director and/or designee served on both parties, be submitted to binding arbitration, under the Texas General Arbitration Act (Tex. Civ. Prac. & Rem. Code Ann., Ch. 171 – "the Act"). Arbitration shall be conducted according to the following procedures:

   a. Upon the decision of the Director and/or designee or upon written notice to the Director and/or designee form either party that a dispute ahs arisen, the Director and/or designee shall notify all parties that they must resolve the dispute within thirty (30) days or the matter may be referred to arbitration.

   b. If the dispute is not resolved within the time specified, any party or the Director and/or designee may submit the matter to arbitration conducted by the American Arbitration Association under the rules of the American Arbitration Association, except as otherwise required by the City's contract with American Arbitration Association on file in the Office of the City's Affirmative Action Division.

   c. Each party shall pay all fees required by the American Arbitration Association and sign a form releasing the American Arbitration Association and its arbitrators from liability for decisions reached in the arbitration.

   d. In the event the American Arbitration Association no longer administers Affirmative Action arbitration for the City, the Director and/or designee shall prescribe alternate procedures as necessary to provide arbitration by neutrals in accordance with the requirements of Chapter 15 of the Houston City Code of Ordinances.

These provisions apply to goal oriented contracts. A goal oriented contract means any contract for the supply of goods or non-personal or non-professional services in excess of $100,000.00 for which competitive bids are required by law; not within the scope of the MBE/WBE program of the United States Environmental Protection Agency on the United States Department of Transportation; and :, which the City Purchasing Agent has determined to have significant M/WBE subcontracting potential in fields which there are an adequate number on known MBEs and/or WBE's to compete for City contract.

The M/WBE policy of the City of Houston will discussed during the pre-bid. For information assistance, and/or to receive a copy of the City's Affirmative action policy and/or ordinance contact the Affirmative Action Division at (713) 837-9000, 611 Walker, 20th Floor, Houston, Texas.

EXHIBIT II - ATTACHMENT "B": M/WBE LETTER OF INTENT
SOLICITATION NO.: S33-T23961

THIS AGREEMENT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT.

TO: **City of Houston**
City Purchasing Agent

MINORITY/WOMEN BUSINESS ENTERPRISE (M/WBE) AND SUPPLIER

LETTER OF INTENT

Contract Bid Number: S33-T23961

Bid Title: HVAC Operation & Maintenance Services for the Houston Airport System

Bid Amount: _____

M/WBE Participation Amount: $375,000.00 **M/WBE GOAL** 18%

1. ACS Mechanical Services, Inc. agrees to perform work/supply goods and/or
(Name of Minority/Women Business Enterprise)
services in connection with the above-named contract and TDIndustries, Inc. as:
Name of Prime Contractor

(a) _____ An Individual

(b) _____ A Partnership

(c) X A Corporation

(d) _____ A Joint Venture

2. ACS Mechanical Services, Inc. status is confirmed by M/WBE Directory and/or designee made
(Name of Minority/Women Business Enterprise)
available through the City of Houston Affirmative Action Division. Certificate No.: 11-3-6803

3. TDIndustries, Inc. and ACS Mechanical Services, Inc.
(Name of Prime Contractor) **(Name of Minority/Women Business Enterprise)**
intend to work on the above-named contract in accordance with the M/WBE Participation Section of the City of Houston Contract Bid Provision.

The terms and conditions of Attachment "C" attached hereto are incorporated into this Letter of Intent for all purposes.

Signed-Prime Contractor

Executive Vice President
Title

7-14-2011
Date

Signed-(Minority/Women Business Enterprise)

President
Title

7/11/11
Date

EXHIBIT II - ATTACHMENT "C": CERTIFIED M/WBE SUBCONTRACT TERMS
SOLICIATATION NO.: S33-T23961

Contractor shall insure that all subcontracts with M/WBE subcontractors and suppliers are clearly labeled **"THIS CONTRACT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT"** and contain the following terms:

1. ACS Mechanical Services, Inc. (M/WBE subcontractor) shall not delegate or subcontract more than 50% of the work under this subcontract to any other subcontractor or supplier without the express written consent of the City of Houston's Affirmative Action Director and/or designee ("the Director and/or designee")

2. ACS Mechanical Services, Inc. (M/WBE subcontractor) shall permit representatives of the City of Houston, at all reasonable times, to perform 1) audits of the books and records of the subcontractor, and 2) inspections of all places where work is to be undertaken in connection with this subcontract. Subcontractor shall keep such books and records available for such purpose for at least four (4) years after the end of its performance under this subcontract. Nothing in this provision shall affect the time for bringing a cause of action nor the applicable statute of limitations.

3. Within five (5) business days of execution of this subcontract, Contractor (prime contractor) and Subcontractor shall designate in writing to the Director and/or designee an agent for receiving any notice required or permitted to be given pursuant to Chapter 15 of the Houston City Code of Ordinances, along with the street and mailing address and phone number of such agent.

4. As conclude by the parties to this subcontract, and as evidenced by their signatures hereto, any controversy between the parties involving the construction or application of any of the terms, covenants or conditions of this subcontract shall, on the written request of one party served upon the other or upon notice by Director and/or designee served on both parties, be submitted to binding arbitration, under the Texas General Arbitration Act (Tex. Civ. Prac. & Rem. Code Ann., Ch. 171 – "the Act"). Arbitration shall be conducted according to the following procedures:

    a. Upon the decision of the Director and/or designee or upon written notice to the Director and/or designee form either party that a dispute ahs arisen, the Director and/or designee shall notify all parties that they must resolve the dispute within thirty (30) days or the matter may be referred to arbitration.

    b. If the dispute is not resolved within the time specified, any party or the Director and/or designee may submit the matter to arbitration conducted by the American Arbitration Association under the rules of the American Arbitration Association, except as otherwise required by the City's contract with American Arbitration Association on file in the Office of the City's Affirmative Action Division.

    c. Each party shall pay all fees required by the American Arbitration Association and sign a form releasing the American Arbitration Association and its arbitrators from liability for decisions reached in the arbitration.

    d. In the event the American Arbitration Association no longer administers Affirmative Action arbitration for the City, the Director and/or designee shall prescribe alternate procedures as necessary to provide arbitration by neutrals in accordance with the requirements of Chapter 15 of the Houston City Code of Ordinances.

These provisions apply to goal oriented contracts. A goal oriented contract means any contract for the supply of goods or non-personal or non-professional services in excess of $100,000.00 for which competitive bids are required by law; not within the scope of the MBE/WBE program of the United States Environmental Protection Agency on the United States Department of Transportation; and ;, which the City Purchasing Agent has determined to have significant M/WBE subcontracting potential in fields which there are an adequate number on known MBEs and/or WBE's to compete for City contract.

The M/WBE policy of the City of Houston will discussed during the pre-bid. For information assistance, and/or to receive a copy of the City's Affirmative action policy and/or ordinance contact the Affirmative Action Division at (713) 837-9000, 611 Walker, 20th Floor, Houston, Texas.

EXHIBIT II - ATTACHMENT "B": M/WBE LETTER OF INTENT
SOLICITATION NO.: S33-T23961

THIS AGREEMENT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT.

TO: **City of Houston**
City Purchasing Agent

MINORITY/WOMEN BUSINESS ENTERPRISE (M/WBE) AND SUPPLIER

LETTER OF INTENT

Contract Bid Number: S33-T23961

Bid Title: HVAC Operation & Maintenance Services for the Houston Airport System

Bid Amount: _____

M/WBE Participation Amount: $250,000.00 **M/WBE GOAL** 18%

1. Independent A/C Refrigeration agrees to perform work/supply goods and/or
(Name of Minority/Women Business Enterprise)
services in connection with the above-named contract and TDIndustries, Inc. as:
Name of Prime Contractor

(a) ✓ An Individual

(b) _____ A Partnership

(c) _____ A Corporation

(d) _____ A Joint Venture

2. Independent A/C Refrigeration status is confirmed by M/WBE Directory and/or designee made
(Name of Minority/Women Business Enterprise)
available through the City of Houston Affirmative Action Division. Certificate No.: NAICS-238220

3. TDIndustries, Inc. and Independent A/C Refrigeration
(Name of Prime Contractor) **(Name of Minority/Women Business Enterprise)**
intend to work on the above-named contract in accordance with the M/WBE Participation Section of the City of Houston Contract Bid Provision.

The terms and conditions of Attachment "C" attached hereto are incorporated into this Letter of Intent for all purposes.

Signed-Prime Contractor

Executive Vice President
Title

7-11-2011
Date

Signed-(Minority/Women Business Enterprise)

CEO
Title

7-11-2011
Date

EXHIBIT II - ATTACHMENT "C": CERTIFIED M/WBE SUBCONTRACT TERMS SOLICIATATION NO.: S33-T23961

Contractor shall insure that all subcontracts with M/WBE subcontractors and suppliers are clearly labeled "**THIS CONTRACT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT**" and contain the following terms:

1. Independent A/C Refrigeration (M/WBE subcontractor) shall not delegate or subcontract more than 50% of the work under this subcontract to any other subcontractor or supplier without the express written consent of the City of Houston's Affirmative Action Director and/or designee ("the Director and/or designee")

2. Independent A/C Refrigeration (M/WBE subcontractor) shall permit representatives of the City of Houston, at all reasonable times, to perform 1) audits of the books and records of the subcontractor, and 2) inspections of all places where work is to be undertaken in connection with this subcontract. Subcontractor shall keep such books and records available for such purpose for at least four (4) years after the end of its performance under this subcontract. Nothing in this provision shall affect the time for bringing a cause of action nor the applicable statute of limitations.

3. Within five (5) business days of execution of this subcontract, Contractor (prime contractor) and Subcontractor shall designate in writing to the Director and/or designee an agent for receiving any notice required or permitted to be given pursuant to Chapter 15 of the Houston City Code of Ordinances, along with the street and mailing address and phone number of such agent.

4. As conclude by the parties to this subcontract, and as evidenced by their signatures hereto, any controversy between the parties involving the construction or application of any of the terms, covenants or conditions of this subcontract shall, on the written request of one party served upon the other or upon notice by Director and/or designee served on both parties, be submitted to binding arbitration, under the Texas General Arbitration Act (Tex. Civ. Prac. & Rem. Code Ann., Ch. 171 – "the Act"). Arbitration shall be conducted according to the following procedures:

    a. Upon the decision of the Director and/or designee or upon written notice to the Director and/or designee form either party that a dispute ahs arisen, the Director and/or designee shall notify all parties that they must resolve the dispute within thirty (30) days or the matter may be referred to arbitration.

    b. If the dispute is not resolved within the time specified, any party or the Director and/or designee may submit the matter to arbitration conducted by the American Arbitration Association under the rules of the American Arbitration Association, except as otherwise required by the City's contract with American Arbitration Association on file in the Office of the City's Affirmative Action Division.

    c. Each party shall pay all fees required by the American Arbitration Association and sign a form releasing the American Arbitration Association and its arbitrators from liability for decisions reached in the arbitration.

    d. In the event the American Arbitration Association no longer administers Affirmative Action arbitration for the City, the Director and/or designee shall prescribe alternate procedures as necessary to provide arbitration by neutrals in accordance with the requirements of Chapter 15 of the Houston City Code of Ordinances.

These provisions apply to goal oriented contracts. A goal oriented contract means any contract for the supply of goods or non-personal or non-professional services in excess of $100,000.00 for which competitive bids are required by law; not within the scope of the MBE/WBE program of the United States Environmental Protection Agency on the United States Department of Transportation; and ;, which the City Purchasing Agent has determined to have significant M/WBE subcontracting potential in fields which there are an adequate number on known MBEs and/or WBE's to compete for City contract.

The M/WBE policy of the City of Houston will discussed during the pre-bid. For information assistance, and/or to receive a copy of the City's Affirmative action policy and/or ordinance contact the Affirmative Action Division at (713) 837-9000, 611 Walker, 20th Floor, Houston, Texas.

EXHIBIT II - ATTACHMENT "B": M/WBE LETTER OF INTENT
SOLICITATION NO.: S33-T23961

THIS AGREEMENT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT.

TO: **City of Houston**
City Purchasing Agent

MINORITY/WOMEN BUSINESS ENTERPRISE (M/WBE) AND SUPPLIER

LETTER OF INTENT

Contract Bid Number: S33-T23961

Bid Title: HVAC Operation & Maintenance Services for the Houston Airport System

Bid Amount: _____

M/WBE Participation Amount: $225,000.00 **M/WBE GOAL** 18%

1. Tex Star Bearings agrees to perform work/supply goods and/or
(Name of Minority/Women Business Enterprise)
services in connection with the above-named contract and TDIndustries, Inc. as:
Name of Prime Contractor

(a) NURBANU TAJUDIN An Individual

(b) _____ A Partnership

(c) _____ A Corporation

(d) _____ A Joint Venture

2. Tex Star Bearings status is confirmed by M/WBE Directory and/or designee made
(Name of Minority/Women Business Enterprise)
available through the City of Houston Affirmative Action Division. Certificate No.: _____

3. TDIndustries, Inc. and Tex Star Bearings
(Name of Prime Contractor) **(Name of Minority/Women Business Enterprise)**
intend to work on the above-named contract in accordance with the M/WBE Participation Section of the City of Houston Contract Bid Provision.

The terms and conditions of Attachment "C" attached hereto are incorporated into this Letter of Intent for all purposes.

Signed-Prime Contractor

Executive Vice President
Title

7-14-2011
Date

Signed-(Minority/Women Business Enterprise)

General Manager
Title

7.12.2011
Date

EXHIBIT II - ATTACHMENT "C": CERTIFIED M/WBE SUBCONTRACT TERMS SOLICIATATION NO.: S33-T23961

Contractor shall insure that all subcontracts with M/WBE subcontractors and suppliers are clearly labeled "**THIS CONTRACT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT**" and contain the following terms:

1. Tex Star Bearings (M/WBE subcontractor) shall not delegate or subcontract more than 50% of the work under this subcontract to any other subcontractor or supplier without the express written consent of the City of Houston's Affirmative Action Director and/or designee ("the Director and/or designee")

2. Tex Star Bearings (M/WBE subcontractor) shall permit representatives of the City of Houston, at all reasonable times, to perform 1) audits of the books and records of the subcontractor, and 2) inspections of all places where work is to be undertaken in connection with this subcontract. Subcontractor shall keep such books and records available for such purpose for at least four (4) years after the end of its performance under this subcontract. Nothing in this provision shall affect the time for bringing a cause of action nor the applicable statute of limitations.

3. Within five (5) business days of execution of this subcontract, Contractor (prime contractor) and Subcontractor shall designate in writing to the Director and/or designee an agent for receiving any notice required or permitted to be given pursuant to Chapter 15 of the Houston City Code of Ordinances, along with the street and mailing address and phone number of such agent.

4. As conclude by the parties to this subcontract, and as evidenced by their signatures hereto, any controversy between the parties involving the construction or application of any of the terms, covenants or conditions of this subcontract shall, on the written request of one party served upon the other or upon notice by Director and/or designee served on both parties, be submitted to binding arbitration, under the Texas General Arbitration Act (Tex. Civ. Prac. & Rem. Code Ann., Ch. 171 – "the Act"). Arbitration shall be conducted according to the following procedures:

    a. Upon the decision of the Director and/or designee or upon written notice to the Director and/or designee form either party that a dispute ahs arisen, the Director and/or designee shall notify all parties that they must resolve the dispute within thirty (30) days or the matter may be referred to arbitration.

    b. If the dispute is not resolved within the time specified, any party or the Director and/or designee may submit the matter to arbitration conducted by the American Arbitration Association under the rules of the American Arbitration Association, except as otherwise required by the City's contract with American Arbitration Association on file in the Office of the City's Affirmative Action Division.

    c. Each party shall pay all fees required by the American Arbitration Association and sign a form releasing the American Arbitration Association and its arbitrators from liability for decisions reached in the arbitration.

    d. In the event the American Arbitration Association no longer administers Affirmative Action arbitration for the City, the Director and/or designee shall prescribe alternate procedures as necessary to provide arbitration by neutrals in accordance with the requirements of Chapter 15 of the Houston City Code of Ordinances.

These provisions apply to goal oriented contracts. A goal oriented contract means any contract for the supply of goods or non-personal or non-professional services in excess of $100,000.00 for which competitive bids are required by law; not within the scope of the MBE/WBE program of the United States Environmental Protection Agency on the United States Department of Transportation; and ;, which the City Purchasing Agent has determined to have significant M/WBE subcontracting potential in fields which there are an adequate number on known MBEs and/or WBE's to compete for City contract.

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EXHIBIT II - ATTACHMENT "B": M/WBE LETTER OF INTENT
SOLICITATION NO.: S33-T23961

THIS AGREEMENT IS SUBJECT TO BINDING ARBITRATION ACCORDING TO THE TEXAS GENERAL ARBITRATION ACT.

TO: **City of Houston**
City Purchasing Agent

MINORITY/WOMEN BUSINESS ENTERPRISE (M/WBE) AND SUPPLIER

LETTER OF INTENT

Contract Bid Number: S33-T23961

Bid Title: HVAC Operation & Maintenance Services for the Houston Airport System

Bid Amount: _____

M/WBE Participation Amount: $75,000.00 **M/WBE GOAL** 18%

1. B&B Valves and Fittings agrees to perform work/supply goods and/or
(Name of Minority/Women Business Enterprise)
services in connection with the above-named contract and TDIndustries, Inc. as:
Name of Prime Contractor

(a) _____ An Individual

(b) _____ A Partnership

(c) ✓ A Corporation

(d) _____ A Joint Venture

2. B&B Valves and Fittings status is confirmed by M/WBE Directory and/or designee made
(Name of Minority/Women Business Enterprise)
available through the City of Houston Affirmative Action Division. Certificate No.: NAICS-423720
11-4-8040

3. TDIndustries, Inc. and B&B Valves and Fittings
(Name of Prime Contractor) **(Name of Minority/Women Business Enterprise)**
intend to work on the above-named contract in accordance with the M/WBE Participation Section of the City of Houston Contract Bid Provision.

The terms and conditions of Attachment "C" attached hereto are incorporated into this Letter of Intent for all purposes.

Signed-Prime Contractor

Executive Vice President
Title

7-8-2011
Date

Signed-(Minority/Women Business Enterprise)

CEO
Title

7-11-2011
Date